

Geoengineering as Defensive War: Why Climate
Change Troubles the Waters of Just War Theory

Jonathan Milgrim

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Reading Committee:

Stephen Gardiner, Chair

Fritz Allhoff

Carina Fourie

Amelia Wirts

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Jonathan Milgrim

University of Washington

Abstract

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Jonathan Milgrim

Chair of the Supervisory Committee:

Stephen Gardiner

Department of Philosophy

Anthropogenic climate change will, in the coming decades, threaten some nations with complete annihilation. Even if their citizens survive the storms, droughts, or rising seas, they may become refugees elsewhere, leaving their homelands effectively erased. I argue that this loss of sovereignty can be understood as the result of an unjust war. Framing climate change in this way, however, complicates how we judge right action in war, both before and during conflict.

If climate change constitutes an unjust war, then vulnerable states have a right to defend themselves against its aggression. Geoengineering may represent one such form of defensive action—perhaps the only one capable of slowing or stopping the harm in time. Yet understanding geoengineering as defensive war exposes deep tensions within just war theory, particularly regarding conflicting claims of self-defense and the limits of proportionality.

This project argues for viewing climate change as unjust war and geoengineering as defensive war, examines the challenges this poses for just war theory, and considers possible paths forward for resolving these theoretical tensions.

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Chapter 1: Geoengineering as Self-Defense

1. Introduction

The scope and complexity of climate change force us to confront scenarios that traditional ethical frameworks were never designed to handle. Stephen Gardiner addresses this in *A Perfect Moral Storm*, arguing that climate change presents a “perfect moral storm” of global and intergenerational challenges for which our standard moral models are woefully inadequate.¹ Even a familiar paradigm like the tragedy of the commons fails to capture the problem, since it cannot account for climate change’s gradual, cumulative harms and the fact that those who cause the damage (present generations, industrialized nations) are not the ones who will suffer the worst consequences.² Dale Jamieson has observed that climate change exposes serious shortcomings in conventional ethics. He advocates developing a new climate ethic built on “green virtues”—qualities like humility, temperance, and respect for nature—because our traditional moral theories no longer seem sufficient in the face of this crisis.³ In short, climate change is stretching our ethical principles to the breaking point.

In a similar vein, this project argues that climate change forces our hand in certain areas of normative theory, in particular, it compels us to rethink how we view war. The usual constraints of just war theory no longer seem to hold unconditionally when we consider the existential threat posed by climate change. One area of special concern is the possible use of geoengineering as a defense against the harms of climate change. Some scholars have begun framing climate change itself as a kind of unjust aggression or “unjust war,” which would make geoengineering a form of justified self-defense by those nations most severely affected.⁴

This first chapter lays the groundwork for the central claim of the dissertation and clarifies the problem that animates it. The overarching thesis of this project is twofold. First, climate change is either literally a form of unjust war or is so morally analogous to war that just war theory is the

¹ Stephen M. Gardiner, *A Perfect Moral Storm: The Ethical Tragedy of Climate Change* (New York: Oxford University Press, 2011).

² *Id.* at 155-161

³ Dale Jamieson, “Climate Change, Responsibility, and Justice,” *Science and Engineering Ethics* 16 (2010): 435.

⁴ Rita Floyd, “Solar Geoengineering: The View from Just War/Securitization Theories,” *Journal of Global Security Studies* 8, no. 2 (2023): ogad012, <https://doi.org/10.1093/jogss/ogad012>.

appropriate normative framework for evaluating responses to it. I argue for the stronger disjunct throughout the chapters that follow, but the project's normative conclusions do not require it; the weaker disjunct is sufficient, and the choice between the two ultimately turns on whether "war" is understood as a conceptual category fixed by paradigmatic cases or as a moral category individuated by the kinds of harm and the kinds of response just war theory is designed to evaluate. On the latter reading (which I take to be the right one for the purposes of normative theory) the two disjuncts converge. Second, and more importantly for the structure of the argument, once we take that claim seriously, we encounter the limits of just war theory as currently formulated. The framework was developed to adjudicate conflicts between identifiable parties engaged in discrete hostilities, and it is therefore not equipped, as it stands, to handle a situation in which multiple parties plausibly claim self-defense in response to a diffuse, structural, and ongoing harm such as climate change. This is not a flaw in the tradition; it is a function of the tradition doing what it was designed to do. But it does mean that just war theory, in its current form, is unlikely to be sufficient for evaluating defensive responses to climate change. That insufficiency becomes especially visible when we consider unilateral geoengineering, particularly Stratospheric Sulfate Injection (SSI), as a potential act of national self-defense, and the constructive task of this project is to identify what just war theory gets right in this context, what it cannot do as currently formulated, and how it might be revised to do so.

This chapter establishes the factual and conceptual terrain necessary for the argument that climate change is a form of war and introduces the moral tension that will drive the remainder of the project. I begin by outlining the basic realities of anthropogenic climate change, the uneven distribution of responsibility and harm, and the nature of SSI as a potential defensive response. I then explore existing discussions of self-defense within climate ethics to show that the language of defense is already present, even if underdeveloped. The goal here is to clarify what it would mean for a state to invoke self-defense in this context and to show why that move, if taken seriously, pushes us toward the conceptual territory of war. The next chapter will explicitly argue that climate change constitutes unjust aggression (or is at least morally akin to it), and from there I will demonstrate how that framing exposes fault lines in orthodox just war theory and motivates the need for revision or supplementation.

2. Climate Change and Geoengineering

There is no doubt that we, as humans, are causally responsible for climate change. Carbon dioxide concentrations are at the highest level in over 800,000 years and will continue to rise without drastic, life-altering changes by the vast majority of people on the planet.⁵ In the past sixty years, atmospheric carbon dioxide has risen more than one hundred times faster than the most rapid natural increases known from the geologic record, such as those following the last ice age.⁶ This rise in carbon dioxide levels is causing a host of problems such as global warming and ocean acidification, which in turn cause problems such as sea level rise, disruption of natural food chains, and extreme weather events.⁷ These effects are already visible: coral reefs that take centuries to form are dying, and scientists have recorded the first confirmed mammalian extinction attributable to climate change.⁸ In the coming decades widespread displacement of human populations is likely, perhaps even inevitable, with deaths likely to total in the millions and possibly into the hundreds of millions due to extreme weather events and disruption of food supply.⁹ The first of the effects are already being felt in the form of extreme drought as well as ocean level increases that are forcing the residents of some low-lying islands to move.¹⁰ That all of this is the result of human activity is beyond reasonable debate. The Fourth National Climate Assessment asserts that, “there is no convincing alternative explanation supported by the extent of the observational evidence” and the sixth annual report states, “human activities, principally through emissions of greenhouse gases, have

⁵ U.S. Global Change Research Program, *Climate Science Special Report: Fourth National Climate Assessment, Volume I*, ed. D. J. Wuebbles et al. (Washington, DC: U.S. Global Change Research Program, 2017), Executive Summary, 1, <https://doi.org/10.7930/J0J964J6>.

⁶ *Id.*

⁷ Intergovernmental Panel on Climate Change (IPCC), *Global Warming of 1.5°C: An IPCC Special Report on the Impacts of Global Warming of 1.5°C Above Pre-industrial Levels* (Geneva: IPCC, 2018), 9–12, <https://www.ipcc.ch/sr15/>.

⁸ Ben Guarino and Lindsay Bever, “Climate Change Officially Claims Its First Mammal: The Bramble Cay Melomys Is Declared Extinct,” *The Washington Post*, February 20, 2019, <https://www.washingtonpost.com/science/2019/02/20/climate-change-officially-claims-its-first-mammal-bramble-cay-melomys-is-declared-extinct/>.

⁹ Melissa Denchak, “Are the Effects of Global Warming Really that Bad?” *Natural Resources Defense Council*, March 15, 2016, <https://www.nrdc.org/stories/are-effects-global-warming-really-bad>; World Health Organization, “Climate Change and Health,” last modified October 12, 2023, <https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health>.

¹⁰ Mike Ives, “A Remote Pacific Nation, Threatened by Rising Seas,” *The New York Times*, July 2, 2016, <https://www.nytimes.com/2016/07/03/world/asia/climate-change-kiribati.html>; Hugh Morris, “Cape Town Warns World to Follow Its Lead as It Prepares for Fresh Drought,” *The Telegraph*, November 8, 2018, <https://www.telegraph.co.uk/travel/destinations/africa/south-africa/articles/cape-town-drought-restrictions-water-scarce-cities/>.

unequivocally caused global warming.”¹¹ There are two points that need to be highlighted from the previous set of claims. First, while anthropogenic climate change is a reality, responsibility for it is not evenly distributed across the global population. In terms of total carbon dioxide emissions, the emission from the top three emitters—China, the United States, and India—contribute more than the rest of the world combined.¹² What is more, some of those most affected, such as those likely to lose land due to rising sea levels or those who lose critical growing regions due to water salinification, are well below their carbon budget.¹³ Jamieson puts this into words quite well, saying, “most of the emitting is done by the rich countries of the North, but most of the climate-change-related dying is done in the poor countries of the South.”¹⁴ In short, many of those most likely to suffer the most severe consequences of climate change are not responsible for the current crisis. Faced with this injustice—and with the unwillingness of the wealthiest (and most responsible) nations to invest meaningfully in mitigation and adaptation—some vulnerable countries may eventually turn to unilateral action, such as geoengineering, to defend their sovereignty. The problem with such unilateral action is that the technologies currently envisioned, particularly stratospheric sulfate injection (SSI) for solar radiation management (SRM), are both risky and global in effect. For present purposes, we will focus on SSI in particular. The cause of global warming is that greenhouse gases such as carbon dioxide create a greenhouse effect, trapping more heat within the atmosphere and raising the global temperature. One way of mitigating this rise in temperature is to reduce the amount of sunlight that reaches Earth’s surface. One class of proposals, Solar Radiation Management, would increase the planet’s reflectivity. SSI (also called stratospheric aerosol injection, SAI), is an SRM approach in which sulfate aerosols are introduced into the stratosphere to scatter incoming shortwave radiation and thereby cool the surface. Authoritative assessments describe the basic physical

¹¹ U.S. Global Change Research Program, *Climate Science Special Report*, Executive Summary, at 1; Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2023: Synthesis Report*, accessed January 15, 2025, <https://www.ipcc.ch/report/ar6/syr/>.

¹² International Energy Agency, *CO₂ Emissions in 2023*, March 2024, <https://www.iea.org/reports/co2-emissions-in-2023>. It should be noted that both China and India earn this distinction by virtue of population, while the U.S. earns the distinction by sheer carbon usage. The U.S. has the highest per capita carbon budget of the three and one of the highest in the world.

¹³ Carbon budget here refers to the total amount of carbon the environment can remove from the atmosphere each year, divided by the total number of people.

¹⁴ Jamieson, “Climate Change,” at 439.

mechanism, likely temperature response, and key uncertainties associated with SSI/SAI.¹⁵ The natural precedent is volcanic eruptions, which inspired proposals for SSI and related techniques. In 1991, the Mount Pinatubo eruption resulted in approximately 30 metric tons of sulfate aerosols being ejected into the atmosphere. The result was cooling of approximately 0.5 °C over the course of the next year.¹⁶ It is these results that geoengineering practices such as SSI seek to mimic, using the human equivalent of a sustained volcanic eruption of sulfate into the atmosphere. There are several positive aspects that might tempt a single state or small group of states to attempt SSI implementation without a global consensus. One is cost: SSI is cheaper than other forms of geoengineering in relation to the effect it will have, and the infrastructure needed for its implementation.¹⁷ Another is the time frame that it requires. For example, one potential method of combating anthropogenic climate change is using some form of carbon removal technology, such as direct air capture of carbon or using chemicals to increase the amount of carbon absorbed by the ocean.¹⁸ However, these carbon removal technologies are multi-decade affairs that are expected to work in coordination with other long-term changes. On the other hand, once SSI is implemented the results could be seen in a matter of years rather than decades.¹⁹

However, SSI is not without some serious drawbacks or concerns. The primary issue is that SSI is not localized; it is global and wide-ranging.²⁰ Its use would have widespread effects that, even

¹⁵ National Academies of Sciences, Engineering, and Medicine, *Reflecting Sunlight: Recommendations for Solar Geoengineering Research and Research Governance* (Washington, DC: National Academies Press, 2021), <https://doi.org/10.17226/25762>; see also Royal Society, *Geoengineering the Climate: Science, Governance and Uncertainty* (London: The Royal Society, 2009) and Georges Alexandre Lenferna et al., “Relevant Climate Response Tests for Stratospheric Aerosol Injection: A Combined Ethical and Scientific Analysis,” *Earth's Future* 5, no. 6 (2017): 577–591, <https://doi.org/10.1002/2016EF000504>.

¹⁶ Alan Robock et al., “Studying Geoengineering with Natural and Anthropogenic Analogs,” *Climatic Change* 121, no. 3 (2013): 445–458, <https://doi.org/10.1007/s10584-013-0777-5>; see also Stephen Self et al., “The Atmospheric Impact of the 1991 Mount Pinatubo Eruption,” in *Fire and Mud: Eruptions and Lahars of Mount Pinatubo, Philippines*, ed. Christopher G. Newhall and Raymundo S. Punongbayan (Quezon City: Philippine Institute of Volcanology and Seismology; Seattle: University of Washington Press, 1996), 1089–1115, <https://pubs.usgs.gov/pinatubo/self/>; NASA Earth Observatory, “Global Effects of Mount Pinatubo,” last modified June 15, 2001, <https://earthobservatory.nasa.gov/images/1510/global-effects-of-mount-pinatubo>.

¹⁷ Jesse L. Reynolds, “Solar Geoengineering to Reduce Climate Change: A Review of Governance Proposals,” *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences* 475, no. 2229 (2019): 20190255, <https://doi.org/10.1098/rspa.2019.0255>.

¹⁸ For more information on carbon removal technologies, see: Institute for Carbon Removal Law and Policy, *Explainer: Carbon Removal* (Washington, DC: Institute for Carbon Removal Law & Policy, American University, 2020), <https://carbonremoval.info/explainer>.

¹⁹ Reynolds, “Solar Geoengineering.”

²⁰ Lenferna et al., “Relevant Climate Response” at 579.

if they are overall positive, will likely have negative results for some states. Unlike some forms of tropospheric research, SSI cannot be tested at the climate scale that matters for deployment decisions; its regional and global effects can only be studied through computer modeling or full-scale deployment. Douglas MacMartin and collaborators have proposed a research program of small-scale stratospheric experiments aimed at narrowing specific process-level uncertainties (for example, in aerosol microphysics, stratospheric chemistry, and ozone interactions) and such experiments would mark an incremental advance over modeling alone.²¹ These proposals, however, are limited to narrowly bounded process questions; they are not designed to reproduce, and cannot reproduce, the regional or global climate response of an actual deployment, which remains the dimension of SSI most relevant here. As a result, the potential negative effects are not fully known, and those that are known are worrisome. For example, reducing the amount of sunlight that reaches the surface will affect weather patterns, potentially exacerbating drought in some regions. Following the Mount Pinatubo eruption, extensive flooding occurred along the Mississippi River and extreme drought struck the Sahel region of North Africa, both of which were attributed, or at least suspected to be attributable, to the climate changes introduced by the eruption.^{22,23} A related concern is ocean acidification. Acidification is caused by atmospheric carbon dioxide dissolving into seawater, not by SSI; the worry about SSI here is not that it generates acidification but that it does not address the underlying driver. Because SSI does nothing to lower atmospheric carbon concentrations, the chemical process driving acidification continues unchecked even if surface temperatures are stabilized. That is, SSI's masking of the temperature signal can obscure the persistence of a serious carbon-driven harm. Beyond this, several models predict that SSI's effects on ocean circulation and temperature gradients may regionally exacerbate acidification, compounding the underlying

²¹ Douglas G. MacMartin and Ben Kravitz, "Mission-Driven Research for Stratospheric Aerosol Geoengineering," *Proceedings of the National Academy of Sciences* 116, no. 4 (2019): 1089–1094, <https://doi.org/10.1073/pnas.1811022116>; David W. Keith, Riley Duren, and Douglas G. MacMartin, "Field Experiments on Solar Geoengineering: Report of a Workshop Exploring a Representative Research Portfolio," *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences* 372, no. 2031 (2014): 20140175, <https://doi.org/10.1098/rsta.2014.0175>.

²² Liren Wei et al., "Global Streamflow and Flood Response to Stratospheric Aerosol Geoengineering," *Atmospheric Chemistry and Physics* 18 (2018): 16033–16050, <https://doi.org/10.5194/acp-18-16033-2018>.

²³ It should be noted that while both were attributed, it is not possible to say that the floods and drought would not have occurred regardless. Many climate scientists are extremely reluctant (outright refuse?) to endorse direct causal links such as what is suggested here. Still, there are those that do link such events and for our purposes all it takes is one angry state to take the link as fact and engage in military action. This seems probable if not a surety.

problem in particular areas.²⁴ These expected negative results (along with the worry of unknown unknowns) have led some to reject SSI.²⁵

The transboundary severity just described is what brings the question of war into view, and I want to make the resulting argumentative structure explicit before going further—rather than letting it emerge piecemeal as the chapters unfold. The project rests on two distinct claims about war and climate change. The first is that a state’s unilateral deployment of SSI is itself an act of war: not in any attenuated or metaphorical sense, but in the sense that intentionally imposing severe, foreseeable, transboundary atmospheric harms on the populations and territories of other states is sufficiently serious to count among the kinds of acts the just war tradition was developed to evaluate. The second is that climate change itself amounts to an unjust aggression—an ongoing wrong of the kind and magnitude that can ground a just cause for defensive action.

These two claims are connected, but they are logically independent, and the first does not entail the second. That is, one could grant that unilateral SSI would constitute an act of war while denying that the climate harms motivating it rise to the level of aggression; on that view, a state deploying SSI would simply be initiating war, with no defensive justification available behind it. Put differently, one could hold that climate change amounts to aggression without granting that SSI in response would itself count as war—in which case defensive measures would be permissible, but they would not need to be evaluated under the strictures of just war theory at all. My argument is that both claims are true, and it is the conjunction of the two that makes just war theory the appropriate framework for evaluating SSI as a defensive response to climate change. Each does distinct work. The first is what forces us to take justification seriously rather than treating unilateral SSI as ordinary policy under risk-management norms. The second is what makes a defensive response intelligible rather than itself unjustified aggression. The remainder of this chapter develops the conditions under which something like SSI is intelligible as defensive action and surveys the self-defense frameworks the literature has used to motivate that characterization. Chapter 2 then takes up the second claim

²⁴ Jerry F. Tjiputra et al., “Impact of Idealized Future Stratospheric Aerosol Injection on the Large-Scale Ocean and Land Carbon Cycles,” *Journal of Geophysical Research: Biogeosciences* 121 (2016): 2–27, <https://doi.org/10.1002/2015JG003045>.

²⁵ Some have rejected the idea that SSI and related technology would be easier to implement than other forms of geoengineering and have objections to the use for the above-mentioned reasons as well. See: Mike Hulme, *Can Science Fix Climate Change?* (Cambridge: Polity Press, 2014).

directly and defends the view that climate change satisfies the structure of unjust aggression strongly enough to ground defensive rights for those most severely threatened by it.

A second piece of architecture is also worth settling at the outset. I have already been using phrases like “high-emitting states” and “vulnerable states” in this chapter, and similar phrases will recur throughout the project. Their referents are intuitive enough, but the categorization deserves an explicit treatment here so that the terminology is available as a tool in the chapters that follow. Throughout the project, I will distinguish three rough categories of states. The categories are an idealization—real states do not fall neatly into discrete bins, and where the boundaries should be drawn is itself contested—but they are sufficiently stable to do the argumentative work I will ask of them. I will sharpen the categories and apply them in detail to the *jus ad bellum* requirements in Chapter 3.

The first category is high-emitting states. These are the states whose past and continuing emissions are most causally responsible for anthropogenic climate change. The paradigm cases are the United States and China, and at the per capita extreme, Qatar—which has held the highest per capita emissions in the world for the entirety of this century. Major historical emitters whose current emissions remain high also fall here. When the argument requires it, I will distinguish per capita and aggregate emissions, since each picks out a somewhat different set of states. I treat membership in this category as descriptive in the first instance; whether high-emitting states should be considered the aggressors in the climate case is a substantive normative question that I take up directly in Chapter 2.

The second category is vulnerable states. These are the states that are both least responsible for climate change—low aggregate and low per capita emissions, both historically and currently—and most exposed to its severe and existential consequences: loss of territory to rising seas, salinization of aquifers, destruction of subsistence agriculture, exposure to historically unprecedented storms and flooding. The paradigm cases are low-lying island nations such as the Maldives, Kiribati, and Tuvalu, but the category extends to states such as Pakistan and Bangladesh whose climate exposure is severe even if not literally existential at the territorial level. These are the states whose defensive claims this project is most centrally concerned to evaluate.

The third category is gray-area states. These are the states that fit neatly into neither of the previous categories. India is the clearest case: it is the third-largest emitter in aggregate, but its per

capita emissions are in the bottom quartile due to its population size, and it suffers severe climate-related harms in the form of disrupted monsoons, drought, and flooding. Other gray-area states include those, such as several Northern European nations, that were historically high emitters but have substantially reduced their current emissions, leaving open the question of how to weigh past contributions against present mitigation. These states will receive less direct attention than the other two categories in what follows, but they cannot be ignored: some of the most difficult cases the project must confront, including several of the conflicting-claims scenarios developed in Chapter 3, turn on how to adjudicate their defensive claims.

The question we are dealing with here is hypothetical: what happens if a state or group of states decides to unilaterally engage in SSI? At first glance, it seems fairly straightforward that they should not be allowed to do so given the concerns we have already briefly explored. Such action would also constitute intentional manipulation of the global environment and would potentially implicate the Environmental Modification Convention (ENMOD). ENMOD's application to defensive climate intervention, however, is contested: the Convention prohibits only “military or any other hostile use” of environmental modification techniques and expressly preserves “peaceful purposes,” and where unilateral SSI deployed in self-defense sits between those categories is a live interpretive question, taken up more fully below.²⁶ However, it is more complicated than it looks when we examine the issue further. Consider that all sorts of behaviors that are otherwise prohibited are allowed in certain circumstances. For example, under normal circumstances we are not allowed to grab a knife from the kitchen drawer and stab a visitor in our home. On the other hand, when the “visitor” is an uninvited intruder that is threatening us or our families, using a knife to harm the person is not only allowed but also to some degree expected. From an international perspective, this unilateral (or near-unilateral) use of SSI might qualify as self-defense. This justification is strengthened if the act is viewed as an effort to correct a human-caused disruption to the environment (as mentioned above) that threatens the sovereignty of the state. In this case, our initial hypothetical

²⁶ For the text of the Convention, see United Nations Office for Disarmament Affairs, “Environmental Modification,” accessed March 5, 2019, <https://disarmament.un.org/treaties/t/enmod>. On the interpretive dispute, see Aarti Gupta et al., “Towards a Non-Use Regime on Solar Geoengineering: Lessons from International Law and Governance,” *Transnational Environmental Law* 13, no. 2 (2024): 368–399, at 380–382, noting that ENMOD's effective scope depends on contested readings of “environmental modification,” “severe effects,” and “peaceful purposes.”

shifts to a new question: can a state use the concept of self-defense as a justification for implementing SSI?

3. Geoengineering as Self-Defense

Self-defense is not the most common moral framework when considering the effects of climate change, and might not be the first framework that comes to mind. Self-defense is certainly easier to understand in traditional settings. The war between Russia and Ukraine certainly fits the standard conception of self-defense with Russia attempting, or successfully, annexing parts of Ukraine through the use of force. But with climate change it is much messier. There is no readily identifiable invader or aggressor, nor is there an obvious “bad guy” to target. There has been some recent engagement with the concept of self-defense and the use of SSI.²⁷ Gardiner identifies several problems with invoking self-defense in the climate context. The core issue is that arguments against aggressive climate action, such as the claim that current carbon usage, however undesirable, is economically necessary, do not straightforwardly qualify as legitimate self-defense. The basic case is that if we consider arguments for not making aggressive changes to combat climate change, one of those arguments might be that even though our current carbon usage is undesirable, we need it to maintain our economy. That is, if we make drastic cuts to our carbon output there will be dire economic consequences, including potential loss of life (due to starvation, etc.). Imagined in this way, our current carbon usage can be a defense against terrible consequences that will happen in short order, and this is the sort of argument that we commonly see some politicians in the United States making.²⁸ The issue with framing the problem of climate change in this way is that it is not realistic to say that our current carbon usage is an act of self-defense. As Gardiner points out, self-defense comes with “sharp limits.”²⁹ For such claims of self-defense to be reasonable, it would have to be the case that there was no other option. That is, we would have to have no other options that would do less harm than continuing our carbon emissions at levels far beyond sustainability. However, we know that our carbon emissions are producing harm (and will continue to do so for generations to come). There seem to be many options available to us that do not result in the

²⁷ For example, Stephen Gardiner addresses issues related to self-defense, though explored through a different lens, in his debate with David Weisbach in *Debating Climate Ethics*. See: Stephen Gardiner and David Weisbach, *Debating Climate Ethics* (New York: Oxford University Press, 2016), 122-125.

²⁸ See, for example, Justin Worland, “There’s More Than Meets the Eye to Ramaswamy’s Climate Comment,” *TIME*, August 28, 2023, <https://time.com/6309085/6309085/>.

²⁹ Gardiner and Weisbach, *Debating Climate Ethics*, at 123.

aforementioned loss of life, but at the same time help mitigate the harm due to climate change to current and future generations. Additionally, self-defense claims are normally not allowed if the agent attempting to claim self-defense is the initial aggressor.³⁰ Future generations might be able to invoke some sort of self-defense claims because the world they inherit is in such dire straits that they need to take extreme measures just to feed themselves. However, the current generation in high-polluting countries is at least partially responsible for the state of the world, and it seems disingenuous to claim self-defense against a harm that we ourselves are responsible for bringing about, even in part. This is certainly the case if this claim of self-defense is used to justify continued harm. While there is good reason to doubt that self-defense can be used to justify failures by high-polluting countries to combat carbon pollution, there may be reasons to accept that low-emitting countries that have been disproportionately affected can rely on claims of self-defense.³¹

The discussion that follows raises a question importantly different from the one just considered. The previous section examined whether high-emitting states might invoke self-defense to justify continued emissions, and rejected that framing. The question now is the opposite: whether a small, low-emitting state already facing destruction may unilaterally undertake geoengineering as a defensive measure. Gardiner opens his paper “The Desperation Argument for Geoengineering” with a quotation from Nathan Myhrvold that captures the intuition at stake: “Whether it's life-taking decisions, like wars, or something like a trade embargo, the world is about people taking action, not agreeing to take action. And, frankly, the Maldives could say, ‘Fuck you all—we want to stay alive.’ Would you blame them? Wouldn't any reasonable country do the same?”^{32,33} Here we imagine a country that operates well below its carbon budget and faces disaster or destruction if nothing is done

³⁰ *Id.* at 124.

³¹ There are a host of reasons to worry about the moral considerations attached to geoengineering, particularly if it is implemented by wealthy and powerful countries. See also Patrick Taylor Smith, “Legitimacy and Non-Domination in Solar Radiation Management Research,” *Ethics, Policy & Environment* 21, no. 3 (2018): 341–361; Marion Hourdequin, “Climate Change, Climate Engineering, and the ‘Global Poor’: What Does Justice Require?” *Ethics, Policy & Environment* 21, no. 3 (2018): 270–288, <https://doi.org/10.1080/21550085.2018.1562525>.

³² Stephen M. Gardiner, “The Desperation Argument for Geoengineering,” *PS: Political Science & Politics* 46, no. 1 (2013): 28–33.

³³ Myhrvold quote taken from: Michael Specter, “The Climate Fixers,” *The New Yorker*, May 7, 2012, <https://www.newyorker.com/magazine/2012/05/14/the-climate-fixers>. Myhrvold is a researcher with peer-reviewed work in climate science (see Nathan P. Myhrvold and Ken Caldeira, “Greenhouse Gases, Climate Change and the Transition from Coal to Low-Carbon Electricity,” *Environmental Research Letters* 7, no. 1 (2012): 014019, <https://doi.org/10.1088/1748-9326/7/1/014019>) as well as founder of Intellectual Ventures and former Chief Technology Officer at Microsoft.

to combat climate change. It can be viewed as defending itself against high-emitting ‘aggressor’ countries. While some of the same concerns addressed above still apply to these countries, there does seem to be something importantly different. After all, as mentioned before, there are all sorts of actions that are not normally permitted on moral grounds, but that might be permitted when our lives are at risk.

While this last articulation of self-defense seems like a clearer path when considering climate change—indeed, it maps much more easily onto how we have invoked self-defense so far—it is not without concerns. Gardiner references at least four concerns related to arguing self-defense even in the case of countries that have clean hands (relatively speaking) in relation to carbon emissions and the changing climate.³⁴ One is the previously mentioned restriction on what can be done when acting in self-defense. That is, there are sharp limits, and it is not the case that once self-defense is invoked there is *carte blanche* freedom of action. Additional concerns include: self-defense that results in harm to others needs to be a last resort; there may be multiple parties that can invoke self-defense claims; and it is unclear what right the various parties have to aid when self-defense is being claimed by everyone involved.

Another related concern is the active nature of using SSI as a form of self-defense. The current (and future) harms from carbon emissions are not intentional in the way that harms from SSI would be intentional. A state implementing SSI would need to have someone say, “You did this on purpose” and still expect that they were on morally solid footing. For some, this difference between the harms of climate change that occur due to incidental or unintended results versus those that occur due to intentional manipulation changes the moral weight behind the action. Patrick Taylor Smith articulates this worry by drawing a distinction between “accident” and “redirection.”³⁵ The idea here is that there is an important moral distinction between a harm that is accidental or unintended versus a harm that is deliberately redirected onto a third party who would not otherwise have been affected. For Smith, a justified form of self-defense would require that the defender not knowingly pursue a course that would bring harm to others. The use of SSI with its expected harms, even if those occur in the course of defending oneself from climate-related harms, falls into the latter

³⁴ Gardiner, “The Desperation Argument” at 29-30 and Gardiner, *Debating Climate Ethics* at 201-240.

³⁵ Patrick Taylor Smith, “Who May Geoengineer: Self-Defense, Civil Disobedience, and Revolution (Part One),” *Forum for Climate Engineering Assessment*, May 18, 2016, accessed January 12, 2021, <https://ceassessment.org/who-may-geoengineer-self-defense-civil-disobedience-and-revolution-part-one/>.

category and carries a heavier moral burden. Smith uses the example of repelling a ninja assassin to further highlight the issue. In the first instance you defend yourself with a firearm. The bullet you fire to kill the assassin travels through a nearby wall and kills your neighbor. This is an accident, and though unfortunate, it is not clear that you are morally blameworthy for your neighbor's death. The second case involves swapping the numbers on the door of your apartment with your neighbor, knowing that your neighbor will be killed by the assassin. Smith argues that geoengineering (in our case SSI) is much more like the second case. You may very well be saving yourself, but you are doing it knowing that you are putting other vulnerable countries at risk. However, in the case of geoengineering, it is even more complex because multiple nations are all trying to defend themselves at once (one of Gardiner's concerns). The somewhat hilarious image of multiple neighbors secretly swapping numbers back and forth comes to mind. Each neighbor is trying to undermine the others, all with questionable moral footings on which to stand. Smith's example, and the extended image of neighbors swapping numbers, is not meant to settle the question in favor of SSI but rather to clarify the moral burden it carries. The argument is not that SSI is therefore impermissible, but that any state pursuing it must do so with full acknowledgment that it is redirecting harm rather than merely defending against it, a distinction that bears directly on questions of just cause and proportionality when we use just war theory as the appropriate normative framework.

The primary issue at this stage is to identify what self-defense actually means for a state. For a state, the most extreme form of self-defense is war.³⁶ My positive claim, which the remainder of this chapter is given over to defending, is that the carbon pollution victim countries, those with low emissions but high climate damage, have a legitimate self-defense claim against high-emitting states whose continued conduct sustains the climate threat, and that SSI is, in principle, a permissible expression of that claim. Self-defense permits an agent facing a grave and unjustified threat to act, including by imposing some cost on the responsible party, when no less harmful course of action is available. The conditions that ordinarily generate that permission are present in the climate case: the threat is grave, often existential; the imposition is sustained under conditions of established knowledge; and the responsible parties (the high-emitting states) are identifiable. Framing the situation this way also reverses any attempted defensive claim from the other direction. High-emitting states cannot, in turn, claim self-defense against the victim states' use of SSI, because the right of self-

³⁶ This is meant to simply differentiate between forms of "soft" defense such as political objections, refusing trade, or other non-aggressive means of voicing displeasure or protesting.

defense does not run from the initial aggressor back toward those defending against the aggression. This is where the issue of implementing SSI as a form of self-defense hinges.

The positive claim, in substance, is the one made by Kyle Fruh and Marcus Hedahl. In their paper “Climate Change Is Unjust War: Geoengineering and the Rising Tides of War,” they argue that climate change is the result of an unjust and ongoing war.³⁷ Read in that register, the language of war and self-defense is not provocative metaphor but moral description—the harms are produced by culpable conduct, sustained under conditions of knowledge, and directed in effect at the conditions of sovereignty for vulnerable states.

Several objections naturally arise here, and the remainder of this chapter takes them up in turn: that self-defense presupposes an aggressor and climate change has none; that the harms of climate change do not look like the harms of war; that self-defense framing creates moral hazard for mitigation; and that unilateral SSI imposes risks on third parties without their consent. Each of these worries has weight only if we view the harms from climate change in the most favorable light for the high-emitting states and against the victim states. Once the harms are seen in their proper light—as the result of an ongoing, unjust act of war by identifiable parties—the moral weight shifts back in favor of SSI as self-defense. Whether this move is conceptually sound, however, depends on whether the language of self-defense is doing genuine normative work or merely functioning as a provocative metaphor; that question requires closer examination before the analogy can carry the weight placed upon it.

This self-defense framing invites a predictable objection: that “self-defense” is simply the wrong language for climate change, and therefore the wrong language for geoengineering. I take that objection seriously, because in this context the choice of frame is not cosmetic. It shapes what sorts of reasons count, who may act, what constraints apply, and what institutional responses are seen as legitimate.³⁸

To avoid talking past the objection, it helps to distinguish three senses of “self-defense.” First is doctrinal international law, where self-defense (in the UN Charter’s most familiar formulation) is

³⁷ Kyle Fruh and Marcus Hedahl, “Climate Change Is Unjust War: Geoengineering and the Rising Tides of War,” *The Southern Journal of Philosophy* 57, no. 3 (2019): 378–401.

³⁸ National Academies, *Reflecting Sunlight*, at 1–3, 89–111.

keyed to an “armed attack.”³⁹ Second is moral self-defense, in which agents may permissibly protect basic rights and essential interests against grave harm under conditions of necessity, even where wrongdoing is diffuse or intent is absent. Third is political rhetoric: “self-defense” as a way of narrating emergency, mobilizing exceptional measures, and asserting standing to act. The worry is perhaps strongest with respect to the first and third senses, but my argument relies on the second.⁴⁰

In doctrinal international law, “self-defense” is narrow: Article 51 preserves an inherent right of individual or collective self-defense “if an armed attack occurs.”⁴¹ Whether climate change or unilateral SAI could ever qualify as an “armed attack” for Article 51 purposes is (for present purposes) unspecified, and I do not rely on that claim. My concern is moral self-defense: the permissibility of taking otherwise unlawful or sovereignty-invading measures to protect basic interests—territorial integrity, subsistence, political existence—under conditions of necessity. Once SSI is understood as an intentional, globally distributing intervention, the relevant question is not whether it is tidy, but whether it can satisfy the sharp limits that distinguish defense from mere preference: last resort, proportionality, and a constrained aim. That moral grammar is precisely what motivates the more careful “defensive deployment” proposals in the SRM literature.

The empirical premise that makes “defense” intelligible is that for some small island and low-lying states, climate change threatens political existence, not merely welfare. NOAA data for Funafuti B, Tuvalu (station 732-012; 1977–2022) reports a relative sea-level trend of 3.92 mm/year (± 2.55 mm/year, 95% CI), illustrating how locally salient exposure can outrun the comfort of global averages.⁴² The IPCC’s AR6 WGII assessment likewise emphasizes that risks are amplified for small islands and that the risk of reduced habitability is highest for atoll nations, with some islands potentially becoming uninhabitable this century.⁴³ When a community’s territory becomes functionally uninhabitable through salinization, inundation, and loss of critical infrastructure, the

³⁹ United Nations, *Charter of the United Nations*, art. 51, 1945.

⁴⁰ Floyd, “Solar Geoengineering,” at 3–9 (PDF pagination).

⁴¹ UN Charter, art. 51.

⁴² National Oceanic and Atmospheric Administration (NOAA), Center for Operational Oceanographic Products and Services (CO-OPS), “Station 732-012: Funafuti B, Tuvalu – Sea Level Trends (1977–2022),” Tides & Currents, n.d., accessed March 3, 2026, https://tidesandcurrents.noaa.gov/sltrends/sltrends_station.shtml?id=732-012.

⁴³ Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, ed. H.-O. Pörtner et al. (Cambridge: Cambridge University Press, 2022), chap. 15.

wrong at stake is the erosion of the material preconditions of sovereignty, precisely the kind of protected interest that typically grounds defensive claims.

Legal touchstones do not themselves settle permissibility, but they clarify why unilateral SSI is not “ordinary policy.” ENMOD defines “environmental modification techniques” as deliberate manipulation of natural processes affecting, *inter alia*, the atmosphere and prohibits hostile use of such techniques when they produce “widespread, long-lasting or severe effects.”⁴⁴ The treaty also states that it “shall not hinder” peaceful uses, which is why any claim that ENMOD flatly prohibits SSI in all forms is, at minimum, contested (and specifics beyond these provisions are unspecified here).⁴⁵ Still, ENMOD’s structure matters: international legal architecture already treats deliberate environmental manipulation as war-adjacent when deployed coercively. In parallel, the ICJ’s Advisory Opinion makes clear that the diffuse and multifaceted nature of conduct contributing to climate change “does not preclude” a duty to prevent significant harm to the climate system and grounds that duty in due diligence.⁴⁶ This supports a core moral point: diffuse causation is not exculpatory; it is a predictable feature of the wrong.

The most natural objection is that self-defense presupposes an aggressor, and climate change has none. This will be explored more fully in the next chapter, but it is worth addressing here as well. To state my position directly: I disagree with the premise that the climate case lacks an aggressor. I grant the narrow point that there is no hostile, intent-driven attacker. Climate change is not produced by parties acting with the conscious aim of harming others. But the absence of hostile intent does not entail the absence of an aggressor. The aggressors in the climate case are the high-emitting states that have, under conditions of established knowledge, maintained the risk-imposing system whose foreseeable and avoidable harms now threaten the sovereignty of other states. That sustained maintenance constitutes culpable endangerment, and culpable endangerment is the kind of wrongdoing that grounds defensive rights, whether or not it is accompanied by malice. Fruh and Hedahl’s formulation of “unwarranted, albeit unintentional, aggression” is best read in this register:

⁴⁴ Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD), opened for signature May 18, 1977, entered into force October 5, 1978, arts. I–II, <https://www.un.org/disarmament/enmod/>.

⁴⁵ ENMOD, art. III.

⁴⁶ International Court of Justice (ICJ), *Obligations of States in Respect of Climate Change*, Advisory Opinion, July 23, 2025, para. 279.

the wrong is not hatred, but the responsible maintenance of a risk-imposing system under conditions of knowledge.⁴⁷

The response above identified high-emitting states as the agents in question. The remaining worry, which McMahan's case helps address, is whether "aggressor" can properly be extended to agents who lack hostile intent. To see why it can, we should consider the structure of the objection that self-defense requires an aggressor. The worry is not merely that climate change lacks a hostile agent in the conventional sense, but that without such an agent, the concept of self-defense loses its logical foothold entirely. On this reading, self-defense is a relational concept: A defends against B. If there is no B, there is no self-defense, only emergency management or disaster response. The objection has real force, and it would be a mistake to treat it as a mere terminological quibble. However, the objection succeeds only if "aggressor" is understood as requiring a discrete agent who acts with hostile intent. And there are good reasons to resist that narrow reading. Consider a case that Jeff McMahan raises in a different context: a person is culpably responsible for creating a dangerous situation, perhaps through recklessness or negligence, even though they never intended to harm anyone.⁴⁸ In such cases, the endangered party retains a right of defensive action against the person whose conduct created the threat, not because that person is an "aggressor" in the paradigmatic sense, but because they are the responsible source of an unjustified threat. What does the moral work is not hostility but responsibility for a threat that is foreseeable, avoidable, and serious enough to endanger the basic conditions of continued existence. Climate change fits this pattern. The industrialized states whose cumulative emissions are driving sea-level rise and territorial loss are not enemies in the traditional sense, but they are the identifiable, responsible sources of a foreseeable and sovereignty-threatening process. They are the parties against whom a defensive claim is directed, not because they intended harm, but because they have sustained it under conditions of knowledge. The objection that self-defense requires an aggressor therefore proves less than it initially appears. It requires a responsible party whose conduct generates a serious and unjustified threat. Climate change provides exactly that, even without intent.

A second objection is moral hazard: geoengineering talk can weaken mitigation. Here the requirement should be structural, not aspirational: any credible self-defense claim must be tied to

⁴⁷ Fruh and Hedahl, "Climate Change Is Unjust War," at 387–390.

⁴⁸ Jeff McMahan, "The Basis of Moral Liability to Defensive Killing," *Philosophical Issues* 15 (2005): 386–405, at 394.

continuing emissions reductions and must be framed explicitly as a temporary, risk-limiting measure rather than a substitute.⁴⁹ A third objection is legitimacy: unilateral SSI imposes risks on others without consent. That objection does not defeat the self-defense frame, but it raises the justificatory threshold, because defensive permissibility in a global externalities case must include procedural constraints that reduce domination and arbitrariness.

A disciplined self-defense framework can be made action-guiding by mapping *jus ad bellum* constraints onto SSI design and governance. Last resort requires more than political frustration; it requires a plausible showing that mitigation/adaptation pathways will not preserve basic state interests at the relevant timescale.⁵⁰ Proportionality should be operationalized as minimal-effective cooling: the narrowest intervention compatible with preserving habitability, with a presumption against “overshoot” and against designs that predictably impose comparable existential risks on others.⁵¹ Discrimination, in this context, is not “no one is affected,” but “no one is treated as a mere dumping-ground for risk”: that implies intensive monitoring, transparency, and an explicit compensation architecture for foreseeable harms. Authority and right intention require that the aim remain defensive (survival, not advantage), and that decision structures include meaningful consultation with affected states. Practically, this points to institutional safeguards that make “defense” less escalatory: advance consultation and notification; independent monitoring and open data; liability/compensation mechanisms; and “exit ramps” (pre-committed sunset clauses, termination management, and governance triggers for pause/withdrawal) that reduce the fear of unbounded, unilateral control.

The appeal of the moral sense is straightforward. If climate change threatens a community’s territorial integrity, subsistence, or political existence, and if collective mitigation and adaptation remain insufficient, then some actors will predictably argue that they must act to defend the conditions of life itself. This is the moral impulse Fruh and Hedahl aim to capture when they analyze whether SRM might be justified absent international consensus in cases of existential threat.⁵² It is also implicit in “just geoengineering” proposals that treat major climate emergency as the functional analogue of just cause and then attempt to import further constraints from the just war tradition—

⁴⁹ National Academies, *Reflecting Sunlight*, 2021.

⁵⁰ Fruh and Hedahl, “Climate Change Is Unjust War” and IPCC, *Climate Change 2022: Impacts, Adaptation, and Vulnerability*.

⁵¹ National Academies, *Reflecting Sunlight*, 2021.

⁵² Fruh and Hedahl, “Climate Change Is Unjust War,” 384-395.

competent authority, proportionality, discrimination, and last resort—precisely to restrain the temptation to treat geoengineering as an unconstrained “techno-solution.”⁵³

Yet the objection remains: even if one can reconstruct a moral analogue, why insist on the language of self-defense rather than necessity, humanitarian rescue, or climate justice? Here I concede two points. First, self-defense talk can misdescribe the structure of responsibility in climate change by implicitly searching for an aggressor. As Floyd notes, standard just war theory is aggressor-focused, which creates pressure in climate contexts where no attacker with *mens rea* can be identified.⁵⁴ Second, self-defense rhetoric can carry dangerous institutional effects. In a world with weak or fragmented governance, states may interpret unilateral SAI as coercive or threatening and respond in escalatory ways, potentially even seeking to justify countermeasures as “self-defense.”⁵⁵

These concessions, however, do not require abandoning the frame altogether. They require disciplining it. In particular, the self-defense frame is most appropriate only in what I will call defensive deployment cases: situations where (i) the threatened object is genuinely basic (life, subsistence, territorial integrity, political existence), (ii) the threatened community is not merely seeking to preserve unjust advantage, (iii) less-intrusive options are unavailable at the relevant timescale, and (iv) any deployment is designed under stringent constraints aimed at minimizing wrongful harm and domination.⁵⁶ This last condition is crucial. The justice literature on SRM repeatedly emphasizes that legitimacy and non-domination are not optional add-ons; in a globally distributing intervention, they are part of what makes an action permissible at all.⁵⁷

Under those conditions, self-defense language does useful work. The reason to invoke just war theory specifically is that an endangered state’s use of SSI threatens significant harm to other states and is an intentional harmful act, the kind of serious act that can only be justified by the very high moral standards of permissible self-defense. The framework keeps in view both (a) the extremity of the threatened harm to the endangered state and (b) the moral seriousness of the harm the defensive action itself imposes on others.. But outside those conditions, self-defense becomes

⁵³ Elizabeth L. Chalecki and Lisa L. Ferrari, “A New Security Framework for Geoengineering,” *Strategic Studies Quarterly* 12, no. 2 (2018): 82–107, at 91–98.

⁵⁴ Floyd, “Solar Geoengineering,” 4–7.

⁵⁵ Craig Martin and Scott Moore, “Geoengineering Wars and Atmospheric Governance,” *Harvard International Law Journal* 66, no. 1 (2025): 77–150, at 123–135.

⁵⁶ National Academies, *Reflecting Sunlight*, 101–108.

⁵⁷ Smith, “Legitimacy and Non-Domination,” at 341–347.

inappropriate—especially when invoked by high emitters to justify unilateral control, when used to bypass inclusive governance, or when it functions as a rhetorical solvent that dissolves the requirement to consult, compensate, and subject action to oversight. In those settings, frames like necessity (with strict “only way” and proportionality disciplines), humanitarian protection (centered on vulnerable populations and rescue ethics), and climate justice (centered on differentiated responsibility and repair) are ethically cleaner and institutionally less inflammatory.⁵⁸

If we examine the various self-defense frameworks, we see that this is still the case. Self-defense applies when an agent faces a grave threat to basic rights or vital interests and may impose harm only as necessary and proportionate to avert it.⁵⁹ On liability views, permission tracks responsibility for wrongful threats, so maintaining risk-imposing emissions under knowledge can generate liability without hostile intent.⁶⁰ On lesser-evil/necessity views, justification turns on preventing the greater harm under strict proportionality; habitability-threatening climate risks can thus invite defensive, risk-limiting measures.⁶¹ On agent-relative prerogative views, agents may prioritize their own survival and projects, so a polity need not treat its existence as interchangeable with others’ values.⁶² On autonomy and anti-domination views, defense protects agency and self-rule, and climate-driven loss of territory, water, and subsistence attacks those preconditions.⁶³ On political self-defense, the object is communal independence; even critics of the state analogy debate when defensive prerogatives extend to collective entities facing existential loss.⁶⁴ What this survey establishes is something narrower than wholesale endorsement of any one framework, but more useful for present purposes: each major theory of self-defense treats the climate case as the kind of case to which it should apply. Liability views ask whether high-emitting states have generated wrongful threats by maintaining a risk-imposing system under conditions of knowledge. Necessity views ask whether SSI is the only available way to avert the greater harm. Agent-relative views ask whether a

⁵⁸ Pablo Suarez and Maarten K. van Aalst, “Geoengineering: A Humanitarian Concern,” *Earth’s Future* 5, no. 2 (2017): 183–195, <https://doi.org/10.1002/2016EF000464>.

⁵⁹ Helen Frowe, *Defensive Killing* (Oxford: Oxford University Press, 2014) and Jeremy Waldron, “Self-Defense: Agent-Neutral and Agent-Relative Accounts,” *California Law Review* 88, no. 3 (2000): 711–49.

⁶⁰ Jeff McMahan, *Killing in War* (Oxford: Oxford University Press, 2009) and Frowe, *Defensive Killing*.

⁶¹ Waldron, “Self-Defense” and IPCC, *Climate Change 2022*, chap. 15.

⁶² Thomas Nagel, *The View from Nowhere* (New York: Oxford University Press, 1986).

⁶³ Christine M. Korsgaard, *The Sources of Normativity* (Cambridge: Cambridge University Press, 1996) and Cécile Fabre, *Cosmopolitan War* (Oxford: Oxford University Press, 2012) and NOAA, “Station 732-012.”

⁶⁴ Michael Walzer, *Just and Unjust Wars: A Moral Argument with Historical Illustrations* (New York: Basic Books, 1977) and David Rodin, *War and Self-Defense* (Oxford: Oxford University Press, 2002).

polity facing extinction may prioritize its own survival. The substantive disagreement among these positions, that is, concerns whether the relevant conditions are met in the climate case, not whether self-defense is the wrong moral register for the question.⁶⁵ The upshot is that the burden has shifted. A critic who wishes to deny that climate change can ground defensive claims must show that the climate case fails self-defense's conditions across frameworks, not merely that “self-defense” sounds like the wrong vocabulary.

This brings the argument to a fork, and one I want to be explicit about. The maximal claim (the one defended in the next chapter) is that climate change is itself a form of unjust aggression, such that a self-defense paradigm is more than metaphor and the conditions of justified defense really are satisfied in central cases. A weaker but still significant claim is that the self-defense strand should be treated as a constrained analogue operating alongside necessity and justice-based frames; on this version, defensive language tracks something morally real even if climate change is not strictly aggression. The next chapter defends the maximal claim. Even if a reader resists that conclusion, however, the weaker claim survives and is sufficient to motivate the rest of the project. Either way, the argument sets up a distinctive problem: if “defense” becomes available to multiple actors under diffuse responsibility and competing vulnerability, then just war theory faces an instability precisely because its most central justificatory concept no longer clearly identifies who may act, against whom, and under what authority.⁶⁶

4. Conclusion

This chapter establishes the conceptual and factual foundation for the argument that follows. I began by outlining the basic features of anthropogenic climate change and the morally salient asymmetries it creates: those least responsible for emissions often face the most severe threats to territory, food security, and political stability. I then examined stratospheric sulfate injection as a representative form of solar geoengineering, emphasizing both its comparative speed and cost-effectiveness and its global, uneven, and potentially destabilizing consequences. Finally, I surveyed the emerging literature that frames unilateral geoengineering as a form of national self-defense, highlighting the moral structure implicit in such claims.

⁶⁵ Frowe, *Defensive Killing* and Waldron, “Self-Defense” and National Academies, *Reflecting Sunlight*.

⁶⁶ Floyd, “Solar Geoengineering,” at 8-11.

Taken together, these elements point toward the central thesis of the dissertation. Climate change is best understood as a form of unjust aggression, or at least as morally analogous to war in the respects that matter for normative evaluation. Once framed in this way, just war theory becomes the most appropriate ethical framework for assessing the permissibility of defensive responses such as SSI. At the same time, this application reveals a significant tension within the tradition itself. Just war theory was developed to adjudicate conflicts between identifiable parties engaged in discrete hostilities. Climate change, by contrast, involves diffuse causation, structural harm, and the possibility of multiple, overlapping claims of self-defense. When defensive action itself has global and redistributive effects, the standard categories of the theory begin to strain.

The next chapter develops the claim that climate change constitutes unjust aggression in a sense strong enough to ground defensive war. From there, the project turns to the deeper challenge: whether just war theory, as currently formulated, can coherently address cases of competing and simultaneous self-defense in a structurally interconnected world and what revisions may be required if it cannot.

Chapter 2: Climate Change as Unjust War

1. Introduction

In the previous chapter, I argued that certain forms of solar geoengineering—especially stratospheric sulfate injection (SSI)—can only be intelligible as self-defense if the underlying harm they respond to is of the sort that can ground defensive rights. That claim leaves open the central question of this chapter: is climate change the kind of wrong that can generate a just cause for war? Or is the language of self-defense a category mistake? Fruh and Hedahl offer one of the most direct and philosophically ambitious attempts to answer that question. In their paper, they argue not merely that climate change resembles war metaphorically, but that it satisfies the normative structure of unjust war in a way strong enough to justify defensive action by those most vulnerable to its effects.⁶⁷ Their argument proceeds by way of the just war tradition. Rather than beginning with a rhetorical comparison, they ask: if unilateral geoengineering would constitute an act of war, could it nonetheless be justified as self-defense? If so, what must be true of climate change for that to be the case? Their conclusion is deliberately provocative: if unilateral geoengineering can be justified as defensive war, then climate change itself must count as unjust war. What follows is a careful reconstruction of their reasoning, along with several expansions that strengthen and clarify the argument in ways necessary for the present project.

2. Fruh and Hedahl's Argument

Fruh and Hedahl begin with what they take to be the morally decisive empirical premise: some low-lying states face not merely hardship, but extinction as political communities. States such as Tuvalu, Kiribati, and the Maldives are not simply confronting increased storm frequency or economic disruption; they are confronting the loss of territory sufficient to sustain a permanent population. As they note, once a state can no longer maintain territory and population, it cannot satisfy even the minimal conditions of statehood.⁶⁸ This move is crucial. The threat is not framed primarily as humanitarian, though it certainly is that. It is framed as sovereignty-threatening. Climate change places at risk the territorial integrity and political independence of identifiable states. And

⁶⁷ Fruh and Hedahl, "Climate Change Is Unjust War."

⁶⁸ *Id.* at 380-382.

within the just war tradition, violations of territorial integrity and political sovereignty are paradigmatic just causes. Here, the argument can be strengthened in two ways.

First, the existential nature of the threat is not speculative. Sea-level rise is not merely projected; it is underway. In many atoll states, groundwater salinification, storm-driven flooding, and coastal erosion are already degrading the material preconditions of political independence. The wrong is not purely anticipatory. As Fruh and Hedahl emphasize, “the attack is slow—but it is already underway.”⁶⁹ Second, sovereignty here is not reducible to aggregate welfare. The disappearance of Tuvalu is not equivalent to the redistribution of its citizens into other states, even if their material conditions were preserved. Political community, territory, and self-determination are collective goods. Their destruction is not captured by standard humanitarian frameworks. This matters because just war theory is fundamentally concerned with the defense of political communities.

The next step in their argument reverses the direction of moral analysis. Suppose a low-lying state unilaterally deploys solar radiation management technology. Would that action violate the sovereignty of other states? Fruh and Hedahl argue that it would. Large-scale atmospheric manipulation alters global climatic conditions in ways that will advantage some states and disadvantage others.⁷⁰ Even if undertaken with restorative intentions, unilateral deployment constitutes an intrusion into the shared atmospheric system on which all states depend. It is therefore properly interpreted as a sovereignty violation. This point is strengthened by both historical and legal considerations. The just war tradition has long treated certain environmental interventions as acts of war. Moreover, international law—particularly the Environmental Modification Convention—reflects a recognition that deliberate manipulation of environmental systems can constitute hostile interference.⁷¹ If unilateral geoengineering counts as a sovereignty-violating act, then it demands justification under *jus ad bellum* criteria. It cannot be treated merely as technocratic climate policy. This sets up the central inferential pivot of their argument.

Although I addressed the no-aggressor objection in Chapter 1 by identifying high-emitting states as the aggressors, Fruh and Hedahl approach the issue from a different direction. Rather than expanding who counts as an aggressor, they challenge a prior assumption embedded in many

⁶⁹ *Id.* at 389.

⁷⁰ *Id.* at 384.

⁷¹ *Id.* at 383.

interpretations of just war theory: that just cause requires intentional aggression by a discrete agent at all. The distinction matters. My Chapter 1 move preserves the structure of traditional just cause analysis—aggressor, victim, defensive right—and simply argues that high-emitting states satisfy the aggressor role despite the absence of hostile intent. Fruh and Hedahl’s strategy is more revisionary. They argue that the very requirement of an identifiable aggressor is a contingent feature of the just war tradition, one that reflects the paradigmatic cases the tradition was developed to handle rather than any deep moral truth about defensive rights. On their reading, what grounds defensive permissions is not the presence of an aggressor but the presence of a serious, unjustified, and ongoing threat to political existence, where identifiable actors bear causal and moral responsibility for sustaining that threat. These two routes converge on supporting defensive claims for vulnerable states, but they do so through different theoretical structures, and Fruh and Hedahl’s more revisionary move is worth tracing in some detail.⁷²

They make two important moves here. First, they note that modern just war theory has moved away from punishment as a central justification for war. The focus is no longer on avenging guilty intentions, but on resisting sovereignty-threatening incursions. What matters morally is the presence of a serious, unjustified threat to political independence—not the mental state of the party responsible.⁷³ Second, they argue that well-understood, avoidable, and ongoing harms can ground just cause even when not intentionally inflicted. They offer examples involving negligent nuclear stewardship and environmental poisoning to show that intransigent negligence can justify defensive response.⁷⁴ This is perhaps the most philosophically important move in their paper. Climate change is not an “armed attack” in the narrow kinetic sense. But it is a foreseeable, avoidable, sovereignty-threatening process maintained through continued conduct under conditions of knowledge. That structure, they argue, is sufficient for just cause.

The relevant moral category is not malicious intent but culpable endangerment. If a set of actors knowingly maintains a system that foreseeably erodes another state’s territory and political independence, the absence of animus does not eliminate the wrong. Just war theory, properly interpreted, tracks the severity and character of the harm rather than the subjective hostility of its source. Moreover, the multiplicity of contributors does not dissolve responsibility. Diffuse causation

⁷² *Id.* at 384-386.

⁷³ *Id.*

⁷⁴ *Id.*

complicates attribution, but it does not convert aggression into natural misfortune. In fact, the collective nature of the harm underscores its structural character.

Fruh and Hedahl are careful to distinguish their claim from a justification of preventive war. Preventive war is widely regarded as illegitimate because it responds to speculative future threats. Climate change, however, is not merely looming. It is already inflicting material harm. The accumulation of greenhouse gases is not hypothetical; it is an ongoing process with observable effects.⁷⁵ Their river-poisoning analogy is instructive. If one state begins slowly poisoning a river that flows into another state, the downstream state need not wait until the poison reaches lethal concentration before acting. The wrong has begun. Climate change, they argue, is structurally analogous. Self-defense here is not anticipatory in the problematic sense. It is reactive to an ongoing assault, albeit one unfolding over decades rather than hours.

Having established just cause, Fruh and Hedahl argue that low-lying states could plausibly satisfy the remaining *jus ad bellum* requirements: right authority, right intention, reasonable chance of success, proportionality, and last resort.⁷⁶

- Legitimate authority is straightforward: recognized sovereign states have standing to defend themselves.⁷⁷
- Right intention follows from the narrowness of the aim: survival, not conquest.⁷⁸
- Reasonable chance of success is more complex, but they argue that SRM has at least a non-negligible probability of mitigating temperature rise quickly enough to preserve territorial habitability.⁷⁹
- Proportionality requires weighing the harms of geoengineering against the harms of inaction. Here they argue that extinction-level harms to entire political communities are morally weighty in ways that cannot be reduced to distributive welfare calculations.⁸⁰

⁷⁵ *Id.* at 389.

⁷⁶ *Id.* at 390-395.

⁷⁷ *Id.* at 390.

⁷⁸ *Id.*

⁷⁹ *Id.* at 391.

⁸⁰ *Id.* at 392.

- Finally, last resort is supported by the repeated failure of international mitigation efforts to secure the survival of the most vulnerable states.⁸¹

Even if one remains uncertain about the empirical details, the structure of the argument is clear: if these criteria can be satisfied, then unilateral geoengineering may qualify as defensive war.

Fruh and Hedahl close with what some readers may find as their most radical claim. If just war theory licenses defensive geoengineering, then it also implies that climate change itself is unjust war.⁸² This is not meant as metaphor. It is a logical consequence of the prior steps. If A may defend itself by violating B's sovereignty because B's conduct constitutes an unjust aggression, then B's conduct must have the normative structure of aggression.

The force of this conclusion is not merely rhetorical. It destabilizes the comfortable assumption that climate change is a tragedy or a policy failure. It recasts it as organized, ongoing violence against the most vulnerable political communities on earth. At the same time, this is precisely where tensions begin to emerge. Just war theory was developed to adjudicate conflicts between identifiable agents within bounded theaters of hostility. Climate change involves diffuse causation, intergenerational harm, probabilistic effects, and globally distributed consequences. If climate change is war, then it is war of a kind that stretches the inherited framework to its limits. That tension is not a weakness in Fruh and Hedahl's argument. It is its most productive feature. It shows that once we accept climate change as war, or as morally continuous with war, the just war tradition must either adapt or reveal its inadequacies.

3. Support for Fruh and Hedahl

Before turning to objections, it is worth noting that Fruh and Hedahl's argument does not stand alone. Their conclusion—that climate change is (or is morally analogous to) unjust war—can be shored up by several independent considerations that converge on the same point: climate change threatens the basic conditions of political survival and does so through mechanisms that have long been treated as war-relevant forms of sovereignty encroachment. The war diagnosis, on this view, is not rhetorical inflation. It is a moral re-description of what is already occurring.

⁸¹ *Id.* at 392-393.

⁸² *Id.* at 395-396.

We begin with the most straightforward reinforcement: the threatened parties themselves consistently describe climate change in existential and security-centered terms. Tuvalu's Prime Minister told the UN General Assembly in 2003 that for a coral atoll nation, sea level rise and severe weather "loom as a growing threat to our entire population," and that the threat is "no different to a slow and insidious form of terrorism against us."⁸³ This statement is not philosophically decisive on its own, but it is evidentially important. It shows that those facing the most severe harms understand the predicament not as a distant cost-benefit problem but as an ongoing coercion aimed (in effect) at the conditions of survival—habitable land, replicable subsistence, and political continuity. In other words, the war-like character of the harm is not an after-the-fact metaphor imposed by theorists; it is a lived description by those who must navigate the prospect of state dissolution.

Second, the empirical record supports the idea that the "attack" is already underway and that it operates through slow degradation rather than instant capture. NOAA's sea-level trend analysis for Funafuti B—3.92 mm/year (± 2.55 mm/year, 95% CI, 1977–2022)—is only one data point, but it illustrates why "existential threat" cannot be dismissed as speculative for atoll states.⁸⁴ More importantly, the IPCC's WGII assessment explicitly frames the risk in habitability terms. It reports with high confidence that reef-island and coastal-area habitability in small islands is expected to decrease due to increased temperature, extreme sea levels, and degradation of buffering ecosystems, increasing exposure to sea-related hazards.⁸⁵ The same assessment emphasizes that comparatively small mean sea-level changes can produce large increases in the frequency of extreme sea-level events and coastal flooding, with the implication that some areas may become uninhabitable well before permanent inundation. This matters for the conceptual structure of Fruh and Hedahl's claim. War is not always a sudden invasion. It can be a slow forcing function that makes territory unusable and political life unsustainable. Climate change fits that pattern with uncomfortable precision.

Third, international legal materials already reflect the basic moral intuition that large-scale environmental manipulation can count as a hostile encroachment even where no border is crossed by troops. The ENMOD Convention prohibits the "military or any other hostile use" of

⁸³ Saufatu Sopoanga, "Tuvalu: Statement by the Honourable Saufatu Sopoanga, Prime Minister and Minister of Foreign Affairs at the 58th Session of the United Nations General Assembly," United Nations, September 24, 2003, accessed March 15, 2024, <https://www.un.org/webcast/ga/58/statements/tuvaeng030924.htm>.

⁸⁴ NOAA, "Station 732-012."

⁸⁵ IPCC, *Climate Change 2022*, chap. 15.

environmental modification techniques having “widespread, long-lasting or severe effects” as the means of destruction, damage, or injury to another State.⁸⁶ The associated interpretive understandings explicitly include “changes in weather patterns” and “changes in climate patterns” among the intended meaning of covered environmental modification phenomena.⁸⁷ ENMOD is not a climate treaty, and it does not simply declare that all climate-relevant modifications are acts of war. But it does codify a war-relevant concept: one need not seize land to unjustly encroach on another state’s sovereignty. Manipulating the shared environmental substrate, at scale, with severe effects, can itself be a prohibited mode of hostility. That framework sits naturally beside Fruh and Hedahl’s contention that climate change’s sovereignty impacts are war-like even absent conventional invasion.

Fourth, the genealogy of the laws of war reinforces the same point from a different angle. It is not only modern treaties that recognize the war-like character of environmental harm. Early modern law-of-nations theorists treated certain tactics—poisoning, contamination, and other methods that weaponize the basic goods of life—as paradigmatic cases of impermissible war-making or perfidy precisely because they expand the field of vulnerability beyond ordinary combat. Grotius, for example, is repeatedly cited in the later tradition as insisting that the law of nations forbids killing by poison for a “general Benefit,” lest dangers common in war be “multiplied beyond Measure.”⁸⁸ Whether or not one accepts every element of Grotius’s framework, the underlying point supports Fruh and Hedahl in one respect: war has long been understood to include threats that operate through water, food, and the ecological conditions on which populations depend. The prohibition itself cuts both ways. If killing by poison is impermissible because it multiplies dangers beyond measure, then any defensive use of SSI is subject to the same constraint, and any such use must operate within tight proportionality bounds, a point taken up in Chapter 4. Grotius is doing diagnostic work here, not licensing work. Climate change, although usually produced without a war-plan, functions increasingly like a system-level contamination of those conditions, with predictable distributive targeting toward the most vulnerable.

Finally, although the UN’s most familiar definitions of aggression emphasize “armed force,” UN materials also show that the category is not conceptually closed. The UN Office of Legal Affairs’

⁸⁶ ENMOD, arts. I-II; Understandings Relating to Art. II.

⁸⁷ *Id.*

⁸⁸ Hugo Grotius, *On the Law of War and Peace*, ed. Stephen C. Neff (Cambridge: Cambridge University Press, 2012), bk. III, chap. IV, sec. XV.

explanatory materials on General Assembly Resolution 3314 note that the enumerated acts are not exhaustive and that the Security Council may determine other acts to constitute aggression.⁸⁹ That clause matters here not because it magically converts climate change into a legally determined aggression, but because it exposes a conceptual opening: the UN system recognizes that novel forms of sovereignty-violating harm may arise that do not map neatly onto traditional templates. Relatedly, the Security Council’s own practice illustrates that threats to international peace and security may be recognized even when the causal driver is not armed conflict—as in Resolution 2177 from 2014, where the Council determined that the Ebola outbreak constituted a threat to international peace and security.⁹⁰ The lesson is not that “everything is war.” The lesson is narrower: the international order’s security vocabulary is elastic enough to address catastrophic, border-transcending threats that destabilize political life. That elasticity makes the war framing less conceptually alien than it first appears, and it helps explain why Fruh and Hedahl’s argument is not merely provocative but structurally continuous with existing ways we already moralize sovereignty-threatening crises.

Taken together, these considerations reinforce the core thesis developed in the previous section: climate change can be described as unjust war not because it resembles battle scenes, but because it produces sovereignty-threatening coercion, deprivation, and territorial compromise at a scale and durability comparable to (and in some respects exceeding) traditional armed encroachment. Seen from the perspective of states facing dissolution, the moral structure looks less like ordinary distributive injustice and more like an ongoing assault on the preconditions of political survival. With that additional support in place, the war diagnosis is in a better position to be tested rather than asserted. It is now appropriate to address the objections directly.

4. Objections to War Framing

The last area that I will explore in this chapter is objections to viewing climate change as war. This is of particular importance since a rejection of viewing carbon emissions as an act of aggression akin to war undermines the project as a whole. That is, the worry is that there is nothing wrong with current understandings of war theory, that this simply is not war. The most basic form of the no-

⁸⁹ United Nations General Assembly, *Definition of Aggression*, GA Res. 3314 (XXIX), UN Doc. A/RES/3314, December 14, 1974, annex, art. 4; United Nations Office of Legal Affairs, “Definition of Aggression,” Audiovisual Library of International Law, accessed May 26, 2025, <https://legal.un.org/avl/ha/da/da.html>.

⁹⁰ United Nations Security Council, *Resolution 2177 (2014)*, S/RES/2177, September 18, 2014.

aggressor objection has already been addressed in Chapter 1, where I argued that the aggressors in the climate case are the high-emitting states whose continued conduct, under conditions of established knowledge, sustains the threat. The objections this chapter takes up are refinements of that worry: that political responsibility does not group cleanly by state, that no single high-emitting state's contribution is individually sufficient, that climate change resembles a natural disaster rather than an act of aggression, and that war requires a discreteness of parties that even a collective of high-emitting states cannot supply.

The idea of treating climate change as a form of war has already been considered and rejected by some. Dale Jamieson argues that "In several important respects, causing climate change is not like one country unjustly invading another country."⁹¹ In making this argument, he points out that political responsibility does not have clear winners grouped by state; there are poor people in every country who are disproportionately affected by climate change, so trying to divide the responsibility (or group the responsibility) by state is incorrect.⁹² There is also the concern that the effects of climate change simply do not look like war. Or stated differently, there is some necessary feature of war that is missing from climate change. Another counterargument is that while the effects of climate change might be viewed as a form of aggression, these effects are not analogous to aggression at the level of war. Instead, this aggression is more like economic sanctions or other forms of "soft" aggression not normally associated with war. I will also consider the argument that climate change does not have a clear starting point. That is, for war there is a beginning of aggression, some singular act that can be pointed out that constituted the moment an unjust war started. Climate change simply does not have that "bombing Pearl Harbor" or "attacking Fort Sumter" type moment that signifies the beginning of war. I conclude my considerations of objections by considering a challenge to JWT as the proper framework and the overuse of "war" as a metaphor or descriptor.

Lack of a Clear Aggressor.

I will first consider the objection referenced above that was articulated by Jamieson. The objection, as I understand it, is that in war we always have readily identifiable parties. It is one state versus another state or one group of states versus another group of states. World War II saw the Allied powers, including the United States, against the Axis powers that included Germany. We can

⁹¹ Jamieson, "Climate Change," at 431.

⁹² *Id.* at 439.

see a clear breakdown of the members of the conflict and readily identify them, even if we disagree about their roles as just or unjust aggressors. Even when the war is internally driven, such as the American Civil War, the factions are easy to identify. However, with climate change there is no specific homogeneous group that is pitted against another similar group. Despite the generalization (mentioned earlier) that the damage is being done by rich countries in the northern hemisphere and the damage is being received by poor countries in the southern hemisphere, in reality it is the poor people all over the world that are suffering most of the injustice of climate change harms.⁹³ Those who are poor are already at risk for harms that are exacerbated by climate change. Examples include those who have limited access to clean drinking water and those that rely on small farms for their food needs. The objection is that climate change does not neatly map onto political responsibility or involvement in the harm. Instead, those most at risk are present in nearly every state and represent a subset in both high-polluting states and low-polluting states. The United States is one of the richest countries in the world, but even here some of the most vulnerable will bear the brunt of the harms.⁹⁴ The conclusion is that climate change cannot be called a war because there is no cohesive aggrieved party or aggressor party; the victims and the victimizers are spread around the globe and present in every state. However, this objection conflates two different problems. The fact that the harms of climate change fall unevenly on poor people within both high-emitting and low-emitting states is a real moral feature of the case, but it concerns the distribution of harm rather than the identification of the aggressor. As argued in the previous chapter, the aggressors in the climate case are the high-emitting states whose continued conduct, under conditions of established knowledge, sustains the threat. Jamieson's worry is best read as targeting the distribution of harm; the response below takes that up directly, and then addresses a second, deeper version of the worry concerning the agency of any single high-emitting state.

The issue for Jamieson and for this problem as a whole is that no one claims that political responsibility cleanly divides the victims from the aggressors. In every war, the poorest are more likely to be affected, and this applies to both sides of the conflict. Historically, those fighting in the

⁹³ World Health Organization, "Climate Change and Health."

⁹⁴ There are numerous sources and studies that support this finding. The Fourth National Climate Assessment is one such source. See U.S. Global Change Research Program, *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II*, ed. D. R. Reidmiller et al. (Washington, DC: U.S. Global Change Research Program, 2018), <https://doi.org/10.7930/NCA4.2018>.

war itself are more likely to be from the lowest income ranks.⁹⁵ Similarly, the poorest civilians are more likely to be affected by war.⁹⁶ To disallow that a war is just because responsibility is not cleanly and clearly applied to all citizens of a state is to relegate all wars to unjust status.⁹⁷ What is more, the distribution worry connects to a deeper question about agency that deserves direct attention. Even granting that the aggressors are high-emitting states, the objection might be pressed in a different form: no single high-emitting state's emissions are individually sufficient to produce the existential climate threat to vulnerable states. If the United States were the only major emitter, the harms of climate change would likely be less severe than they currently are—perhaps not severe enough to threaten the survival of states like Tuvalu or the Maldives. So, when we identify the aggressor as the United States, China, or Qatar, we seem to be picking out a party whose conduct, taken on its own, is not actually doing the work that grounds the defensive claim. The right response to this worry is not to retreat to the strained idea that climate change itself is the aggressor, but to recognize that the aggression in the climate case is collective.⁹⁸ The threat to vulnerable states is produced by the joint conduct of high-emitting states, each contributing to a shared causal process whose cumulative effect is sovereignty-threatening. Collective responsibility is not unfamiliar in just war theory; wars are typically prosecuted by coalitions, and moral responsibility for an unjust war is borne jointly by the states that participate, even where no single state's contribution would have been sufficient on its own. The fact that no individual aggressor's contribution is independently decisive does not eliminate the aggression—it means the aggressor is a group rather than a single party. Climate change itself, on this view, is the result of the aggression, not the aggressor. That is, the warming atmosphere and the rising seas are the mechanisms of harm (the falling bomb, the contaminated water) but the aggressor is the political community that produced and continues to produce them. The morality of any defensive response, then, is judged by proportionality, an issue developed in later chapters.⁹⁹

⁹⁵ Michael E. O'Hanlon, "How the U.S. Military Became the Exception to America's Wage Stagnation Problem," *Brookings*, November 29, 2018, <https://www.brookings.edu/blog/order-from-chaos/2018/11/29/how-the-u-s-military-became-the-exception-to-americas-wage-stagnation-problem/>.

⁹⁶ Costs of War Project, "Human Cost of War: Civilians," Watson Institute for International and Public Affairs, Brown University, accessed December 20, 2025, <https://costsofwar.watson.brown.edu/costs/human/civilians-killed-displaced>.

⁹⁷ A tempting, but ultimately unsatisfactory assessment.

⁹⁸ Mark Nevitt, "Is Climate Change a Threat to International Peace and Security?" *Michigan Journal of International Law* 42, no. 3 (2021): 531–582, at 539–547.

⁹⁹ This is discussed in a later chapter.

A brief terminological note is worth making explicit here. Throughout the dissertation, I sometimes refer to vulnerable states as “defending against climate change” rather than “defending against high-emitting states,” and I sometimes describe climate change as constituting unjust aggression. This is shorthand for the threat-event, on the model of “defending against an invasion” rather than “defending against the invading states”—language that names what is being defended against without thereby identifying it as the agent who bears moral responsibility. Nothing in the argument turns on a literal reading. The aggressors remain the high-emitting states whose joint conduct produces the threat; the morality of defensive action is assessed by reference to their conduct, not by reference to climate change as such. The shorthand is useful in contexts where the focus is on the threat being faced—its scale, its character, its existential implications for vulnerable states—and not on the assignment of responsibility or liability to defensive harm. Where those latter questions are at stake, the analysis returns explicitly to the conduct of high-emitting states.

The collective-aggressor framing also clarifies why some natural-disaster analogies fail. If a naturally occurring super-volcano were about to inundate an atoll state, extraordinary protective measures might be permissible, but it would be strained to say the state is “at war” with the volcano; existential threat alone does not generate the war relation. What is missing in the volcano case is precisely what is present in the climate case: an agent (or set of agents) whose conduct is the responsible source of the threat. If we were to treat climate change itself as the aggressor, we would lose our grip on this distinction, collapsing the climate case into the volcano case, where existential threat is severe but the defensive war framework simply does not apply because there is no responsible party against whom defensive rights can be asserted. The collective-responsibility framing keeps the distinction sharp. The volcano produces existential threat without an agent; high-emitting states produce existential threat through agency, jointly sustained under conditions of knowledge. Holding the line here also responds to a related worry about war language more broadly: that extending the category too far risks importing the moral and institutional permissions of war—emergency politics, exceptional measures—into domains where a responsibility-and-justice framework is normatively cleaner and less escalatory.¹⁰⁰

¹⁰⁰ Rupinder Mangat and Simon Dalby, “Climate and Wartalk: Metaphors, Imagination, Transformation,” *Elementa: Science of the Anthropocene* 6 (2018): 58, at 1–10 (PDF pagination), <https://doi.org/10.1525/elementa.313>.

This comparison obscures a crucial feature of the case at hand. A volcanic eruption is a naturally occurring disaster: no one causes it, no one maintains it, and no one knowingly perpetuates the conditions that bring it about. The harms of climate change are different in kind. They are produced and sustained by identifiable agents (the high-emitting states) whose policies, under conditions of established scientific knowledge, continue to drive the conditions that make those harms inevitable. The distinction my argument requires is one I want to keep visible throughout: climate change itself is not the aggressor; the high-emitting states are. Climate change is the mechanism through which their aggression operates (the rising sea, the failing harvest, the disappearing coastline) much as a falling bomb is the mechanism through which a bombardier's aggression operates. What the volcano case lacks is not the harm, but the bombardier.

This distinction matters because the analogy to the volcano trades on a category mistake. The objection assumes that if the immediate mechanism of harm resembles a natural process, rising seas, shifting weather patterns, changing ecosystems, then the underlying phenomenon must be morally analogous to a natural disaster. But the relevant moral question concerns not the physical mechanism through which the harm occurs, but the origin of the conditions producing it. Put differently: a volcanic eruption that destroys an atoll has the same proximate physical structure as climate-driven inundation of the same atoll, and yet the moral situations differ entirely. In the volcano case there is no party against whom a defensive claim can be directed, because there is no party responsible for the threat. In the climate case there is such a party, the high-emitting states whose joint conduct sustains the threat, and it is against them, not against climate change itself, that the defensive claim is asserted.

Moreover, the sense that it is “absurd” to speak of war in this context may reveal more about the limits of our intuitions than about the structure of the problem itself. Human moral intuitions evolved to navigate conflicts between small groups over short timescales. They are poorly equipped to interpret phenomena that unfold globally, cumulatively, and over generations. Climate change strains these intuitions precisely because it operates at a scale and temporal horizon that our ordinary moral categories were not designed to capture. The fact that the language of war initially feels misplaced may therefore reflect the disruptive nature of the phenomenon rather than a decisive objection to the claim.

There is a further refinement of the aggressor objection that deserves direct attention. One might concede the points already developed (that climate change is not a natural disaster and that high-emitting states bear responsibility for the conditions that produce it) but still insist that what is being defended against is not really war, because war requires parties and a coalition of high-emitting states acting through ordinary economic policy is not a party in the relevant sense. On this view, war requires some entity, a state, an alliance, an identifiable political actor, against whom war is declared or from whom one defends. A diffuse, undeclared coalition does not count.

The cyberattacks analogy is instructive here, and it points the opposite direction from the way the objection assumes. When a state suffers a sustained cyberattack, no one supposes that the defensive claim is directed against the malicious code itself, or against the network through which it travels. The claim is directed against the party initiating the attack — the state or group whose conduct produces the code and sustains its operation. The cyberattack is the mechanism; the attacker is the party. Climate change works the same way: the warming atmosphere is the mechanism; the high-emitting states are the parties. That the mechanism is atmospheric rather than digital does not change the structure of the moral relation. What remains of the objection is the worry that the relevant party in the climate case is too diffuse to count. Here the just war tradition supplies a response without requiring extension. Wars have routinely been prosecuted by coalitions whose membership is large, whose contributions are uneven, and whose internal cohesion is loose—the Allied and Axis powers, NATO operations, multi-state interventions like the Gulf War coalition. The fact that no single state's contribution would have been sufficient on its own does not undo joint responsibility for the campaign as a whole. The climate case is harder because the coalition was never declared and the conduct is economic rather than military, but the underlying moral structure, joint conduct producing a shared, sovereignty-threatening harm, is one the tradition already recognizes. The diffuseness complicates attribution and proportionality, which the remaining chapters take up. It does not eliminate the party.

Indeed, the broader argument that I am developing throughout this project is that climate change systematically destabilizes the normative frameworks through which we ordinarily interpret political conflict. It disrupts our expectations about agency, responsibility, and the timing of harm. The collective and distributed character of the aggression, the gradual accumulation of damage, and the global distribution of both causes and effects all place pressure on concepts that were originally developed to address discrete acts of violence between identifiable parties. Yet this conceptual strain

does not show that the war framework is inappropriate. On the contrary, it may indicate that climate change represents a novel form of aggression, one that differs in its mechanisms but not in its morally relevant consequences.

If the only reason to reject the war framing is that the idea of “going to war with climate change” initially sounds strange, then the objection ultimately rests on intuition rather than argument. But climate change has already shown itself to be profoundly disruptive: it disrupts ecosystems, economies, political stability, and the territorial foundations of states themselves. It should therefore not be surprising that it also disrupts the conceptual frameworks through which we ordinarily understand conflict and responsibility. In this respect, the discomfort produced by the war analogy may be evidence of the scale of the problem rather than a reason to dismiss the analogy outright.

A further way to see the point is by considering a slightly different case. Imagine that a state began flying aircraft over the territory of another state and dispersing a chemical agent that slowly poisoned water supplies and farmland, ultimately killing civilians over time. Even if such an act lacked the familiar imagery of warfare, no explosions, no advancing armies, it would nevertheless be recognized as an act of war. The harm would be intentional, sovereignty-violating, and directed toward the population of another state. What matters in that case is not the presence of explosions or kinetic violence, but the fact that one political community is imposing lethal environmental conditions on another.

Now suppose that the state engaging in such actions could plausibly claim justification, perhaps because it faced an existential threat imposed by the target state. In that situation, the act of dispersing poison would still be an act of war, but it would be a justified one.¹⁰¹ Following the reasoning suggested by Fruh and Hedahl, the justificatory structure works in reverse as well. If unilateral geoengineering such as SSI could ever be justified as defensive action, even minimally, then the underlying harm to which it responds must itself possess the moral structure of aggression. This is the reverse-engineering version of the structural point I made explicit at the outset of Chapter 1: the two claims animating this project—that unilateral SSI is itself an act of war, and that climate change is unjust aggression—are logically distinct but jointly necessary for the just war framework to apply. Accepting that some states might be justified in deploying SSI under conditions of existential threat implicitly commits us to viewing the harms of climate change in war-like terms.

¹⁰¹ I am ignoring, for the purpose of this example, issues with chemical warfare, international bans, etc.

Defensive war requires a prior wrong of the appropriate magnitude. If geoengineering could count as justified defensive action, then climate change must be understood as something morally equivalent to aggression against the threatened political community. The permissibility of defensive geoengineering and the characterization of climate change as unjust war thus stand or fall together.

Missing a Necessary Component.

The second argument involves the kind of thing that constitutes war. That is, there is a lack of some necessary element in climate change. Traditional understandings of war involve some sort of violence. Hundreds of years ago it was armies hitting each other with swords or shooting each other with arrows. That progressed to shooting each other from an even longer distance with firearms. Of course, we still have knives and guns, but now the image of war is much more likely to be explosions related to bombs dropped from high above, or from drones that are piloted half a world away. Though the methods have changed, the violence represents a type of action that might appear to be necessary for war. This line of thought is further supported by the language of the various UN definitions relating to war that make use of the word ‘armed.’ Although this has been explored already, it makes sense to address this concern further since it is the one that seems to trigger our intuitions most strongly.

In response to this charge, we have already seen one counterexample. The burning of a field of crops or the destruction of a forest might be violent in some sense, but certainly the poisoning of a river is not the same sort of violence that we see in the traditional examples. And I have proposed an example of dropping poison from an aircraft that slowly kills civilians. This again is not the same sort of violence that we see in traditional examples. What is more, the issue of cyberwarfare undermines this violence requirement as well. There is still rigorous debate in the community regarding what constitutes cyberwarfare, and when cyberwarfare might shift from hackers and computers to bombs and soldiers with guns, but it is generally agreed that when the use of computers and computer hacking results in loss of life, then a line has been crossed and traditional warfare is justified. Common examples are hacking a dam and flooding the downstream cities or hacking a flight computer to bring down an aircraft. These examples serve to show that while a certain type of violence is common with war, it is not a necessary component. It is also apparent that war has changed over time. Wars between the Romans and Visigoths did not look like the American Revolutionary War, which in turn did not look like World War II. We should expect that war will

look different in the future. The underlying theme is not violence, but as Fruh and Hedahl point out, it is the preservation of sovereignty and the protection of citizens. If this is correct, then the question is no longer whether climate change literally resembles traditional warfare, but whether the harms it produces have the same moral structure as aggression against a political community. Fruh and Hedahl's argument pushes this point further: if unilateral geoengineering could ever be justified as defensive action, then the harms to which it responds must themselves have the character of aggression. In other words, the permissibility of defensive geoengineering and the classification of climate change as unjust war are conceptually linked.

An additional counterpoint is supplied by Gardiner in his paper, "Is No One Responsible for Global Environmental Tragedy?"¹⁰² Gardiner proposes that while greenhouse emissions are not perfectly analogous to tanks rolling across a border, they may be similar in the ways that matter. He offers the example of acid rain as "an intermediate case."¹⁰³ Much like greenhouse emissions, acid rain is caused by airborne pollutants that cross borders. Importantly, there are laws in place that deal with violations (and the sort of invasion they represent).¹⁰⁴ So, while applying just war theory to the use of SSI or calling climate change unjust aggression is messy, it is the same sort of "messy" that is already present in many (or most) wars.

Two points help dissolve the intuition that war must manifest as explosions. First, even in canonical just war theory, aggression is not defined by its weapons but by its sovereignty-violating character: what is attacked is a political community's territorial integrity and independence. Walzer's own structure treats "sieges and blockades" as paradigmatic war problems, underscoring that the tradition already recognizes non-kinetic tactics, starvation, coercive encirclement, and "bloodless" constraint, as war-relevant modes of harming a people.¹⁰⁵ Rodin's critique of war-as-self-defense reinforces the point from the opposite direction: if war is ever justified, it is because the goods at stake (political community and self-determination) are weighty enough to ground defensive permissions even when the threat is not a paradigmatic firefight.¹⁰⁶ Gardiner's "intermediate case" of

¹⁰² Stephen M. Gardiner, "Is No One Responsible for Global Environmental Tragedy? Climate Change as a Challenge to Our Ethical Concepts," in *The Ethics of Global Climate Change*, ed. Denis G. Arnold (Cambridge: Cambridge University Press, 2011), 49.

¹⁰³ *Id.*

¹⁰⁴ It should be noted that while Gardiner questions Jamieson's claim of a disanalogy, he is not rejecting the overall arguments developed by Jamieson.

¹⁰⁵ Walzer, *Just and Unjust Wars*, at 161–68.

¹⁰⁶ Rodin, *War and Self-Defense*, at 40–45.

acid rain makes the same lesson concrete for climate ethics: cross-border atmospheric harms already strain the tanks-and-borders model without ceasing to be morally serious.¹⁰⁷

Second, the leading moral accounts of self-defense do not make kinetic violence a necessary condition. Liability/forfeiture views ask whether an agent is responsible for posing an unjust threat such that the threatened party may impose defensive harms; nothing in that structure requires the threat to arrive via bullets rather than via foreseeable, avoidable poisoning of shared necessities. Necessity-centered accounts similarly focus on whether harmful action is the only proportionate means of averting grave rights-violations, not on the sensory profile of the harm. As a result, the “missing violence” objection has the wrong target: what matters is whether the conduct in question predictably undermines basic rights and the material preconditions of political existence, and whether any purported defensive response can satisfy tight constraints.¹⁰⁸

Finally, the empirical record suggests that what is missing is not violence but spectacle. As previously mentioned, the IPCC reports with high confidence that reef-island and coastal-area habitability in small islands is expected to decrease because of increased temperature, extreme sea levels, and degradation of buffering ecosystems. NOAA’s tide-gauge analysis for Funafuti B reports a relative sea-level trend of 3.92 mm/year (± 2.55 mm/year, 95% CI, 1977–2022), illustrating how territorial compromise can proceed through slow degradation rather than discrete capture.¹⁰⁹ Once the threat is framed in habitability and survival terms, the insistence on “kinetic” markers functions less like a conceptual criterion and more like a psychological heuristic. This also clarifies why SSI cannot be treated as ordinary policy: the National Academies emphasize that solar geoengineering is “not a substitute for mitigation,” and that it creates a distinct decision space that warrants unusually stringent governance constraints.¹¹⁰

Harms are more like Economic Sanctions.

The next potential objection to climate change as an act of war is to equate the cause of climate change to something that we do not include as war. The common concern here is that those who are most responsible for carbon emissions did not intend for the harms to happen, and they

¹⁰⁷ Gardiner, “Is No One Responsible?” at 49–52.

¹⁰⁸ McMahan, *Killing in War*, at 7–10 and Frowe, *Defensive Killing*, at 33–40 and Jonathan Quong, “Killing in Self-Defense,” *Ethics* 119, no. 3 (2009): 507–37, at 507–512.

¹⁰⁹ IPCC, *Climate Change 2022*, chap. 15 and NOAA, “Station 732-012.”

¹¹⁰ National Academies, *Reflecting Sunlight*, at 3–5.

were just doing their best to “get ahead” just like everyone else. The best comparison is economic: one country has a robust economy and appears to maintain it at the expense of other states. While this analogy works on one level, it is the severity of the effect of climate change that moves this beyond mere “competition” and on to something akin to war. A better analogy to economic competition would be extreme economic sanctions, which are already considered under the rules of just war theory by many, or even full-scale economic blockade, where no commerce is allowed under threat of violence. This last example is the only one that has the potential for the same sort of consequences. We can imagine that if a nation completely blockaded another nation, to the point that the citizens of the nation under blockade faced starvation and a corresponding complete collapse of the state, then that would certainly be a call to war. The closest example might be the economic blockade of Cuba by the United States. Imagine the naval blockade of the 1960s extended permanently until society collapsed in Cuba (it is not clear that is possible, but there are certainly other nations where there is extreme reliance on imports for survival). Already there is a UN resolution each year calling for the end of the US economic blockade of Cuba (only the US and Israel vote against the resolution each year).¹¹¹ If the blockade were extended to a full naval blockade, there is little doubt that this would be considered an act of war, and this sort of activity is the closest analogy to the damages from climate change.

The sanctions analogy is illuminating but ultimately underinclusive. Economic sanctions are typically framed as instruments of coercion that operate through markets and finance and are often defended (rightly or wrongly) as alternatives to force; yet the tradition already recognizes that comprehensive deprivation can become war-like when it predictably starves a population or collapses a polity. Walzer’s analysis of siege and blockade makes clear that what renders such measures war-relevant is not their “economic” medium but their aim and effect: they weaponize access to the necessities of life.¹¹² Climate change functions similarly at the limit: it can render territory unusable and political community unsustainable through salinization, flooding, and ecosystem degradation—precisely the kind of reduced habitability risk the IPCC foregrounds for small islands. In that respect,

¹¹¹ United Nations General Assembly, *Necessity of Ending the Economic, Commercial and Financial Embargo Imposed by the United States of America against Cuba*, Resolution A/79/L.6, adopted October 30, 2024, voting record 187–2 (United States and Israel opposed).

¹¹² Walzer, *Just and Unjust Wars*, at 161–68.

calling the harms “like sanctions” does not neutralize the war claim; it pushes the analysis toward sanction-like tactics that already sit on the boundary between coercion and aggression.¹¹³

Moreover, the sanctions frame risks misdescribing the wrong as merely distributive or competitive, as if the relevant complaint were that some states are made poorer. On autonomy-based views, what is at stake is the erosion of the material conditions for self-rule—effective control over territory, secure water and food systems, and the ability to maintain a political community over time.¹¹⁴ Agent-relative approaches help explain why a threatened people may treat preservation of its political existence as non-interchangeable with gains or losses elsewhere, without collapsing into unconstrained partiality.¹¹⁵ In that light, the core question is not whether climate harms look like “economic pressure,” but whether they constitute an imposed, foreseeable narrowing of another community’s option space down to relocation or extinction. If they do, then the moral grammar of defense is triggered even when the mechanism is slow and indirect.¹¹⁶

No Initial Starting Point.

The next objection is that there is nothing to point to as an “inciting act” or a moment of transgression. Earlier I referred to Pearl Harbor and Fort Sumter as a means of identifying moments that initiated hostilities between states, or in the case of Fort Sumter, between political groups within a singular state. There is strong intuitive appeal to this sort of need when thinking about war. It is obvious from the way that moments are highlighted, or perhaps even fabricated. Fort Sumter signified the beginning of aggression between the North and the South in the American Civil War. Pearl Harbor signified the start of hostilities between the United States and Japan in World War II. Numerous other examples exist (the Gulf of Tonkin incident, 9/11, etc.). The importance of this sort of singular event is even codified in just war theory, with the requirement that war be openly declared.¹¹⁷ The problem with climate change is that it has been slowly (in relative terms to most war activity) becoming a factor for a century. You cannot point to a singular time when climate change suddenly became inevitable and needed to be addressed. Without this singular point, it seems that

¹¹³ Gardiner, “Is No One Responsible?” at 49–52 and IPCC, *Climate Change 2022*, chap. 15.

¹¹⁴ Korsgaard, *The Sources of Normativity*, at 100–105.

¹¹⁵ Nagel, *The View from Nowhere*, at 166–170.

¹¹⁶ Samuel Scheffler, *The Rejection of Consequentialism: A Philosophical Investigation of the Considerations Underlying Rival Moral Conceptions* (Oxford: Clarendon Press, 1982), 14–20.

¹¹⁷ The open declaration of war is one of the *jus ad bellum* requirements of engaging in a just war. This is covered more fully in the next chapter.

climate change is different from our common concept of war. Yet even without traditional battlefields or a single inciting attack, the slow devastation of climate change mirrors war's effects. In other words, catastrophic climate harms—mass displacement, famine, loss of territory—are war-like in scale and moral gravity, which justifies treating climate change under a war framework.

While it is true that there is no singular moment to point out in which climate change 'became' a threat—and it is not clear if such a point is even necessary—if one is demanded then it is possible to identify numerous. The first could be the refusal of the United States to join the Kyoto Protocol in 1997, or the date the U.S. fully withdrew from the plan in 2001.¹¹⁸ The United States initially joined the 2015 Paris Climate Agreement, but then withdrew in 2017 under then President Donald Trump.¹¹⁹ President Joe Biden rejoined the agreement, but the withdrawal could be seen as an indicator that the United States will never seriously engage the problem because every time the presidency changes there is a chance (or even likelihood) that the new president will withdraw from the agreement.¹²⁰ Combining this with the general unwillingness to engage with serious mitigation efforts, any one of these dates could be pointed out as the 'Pearl Harbor' of the climate change war. Of course, these dates all reference the United States, but with the unparalleled power that the U.S. exerts throughout the world (both economically and militarily), then it seems fair that the refusal of the United States to join an agreement to combat climate change is tantamount to acknowledging that the rest of the world will never take the problem seriously—at least not in the time needed to enact real change.

More importantly, the assumption that war must begin with a single identifiable moment is not actually required by the logic of self-defense in either just war theory or international law. States are not expected to wait until tanks physically cross their borders before taking defensive measures. In the classic nineteenth-century formulation associated with the Caroline incident, anticipatory self-

¹¹⁸ *Kyoto Protocol to the United Nations Framework Convention on Climate Change*, December 11, 1997, UN Doc. FCCC/CP/1997/L.7/Add.1, entered into force February 16, 2005, https://unfccc.int/kyoto_protocol.

¹¹⁹ *Paris Agreement*, December 12, 2015, UN Doc. FCCC/CP/2015/L.9/Rev.1, entered into force November 4, 2016, <https://unfccc.int/process-and-meetings/the-paris-agreement>; "US Is Leaving the Paris Agreement: How That Will Affect the Global Mission to Curb Climate Change," *ABC News*, November 4, 2020, <https://abcnews.go.com/US/us-leaving-paris-agreement-affect-global-mission-affect/story?id=73861889>.

¹²⁰ This did indeed happen in January 2025, the day of President Trump's second inauguration. See Nate Perez and Rachel Waldholz, "Trump Orders U.S. Withdrawal from Paris Agreement, Revokes Biden Climate Actions," *NPR*, January 21, 2025, <https://www.npr.org/2025/01/21/nx-s1-5266207/trump-paris-agreement-biden-climate-change>.

defense may be justified when the necessity of defense is “instant, overwhelming, and leaving no choice of means, and no moment for deliberation.”¹²¹ The enduring importance of the Caroline formulation lies in the recognition that defensive rights arise not from the timing of the first blow, but from the presence of a threat serious enough that waiting for a discrete act of aggression would make defense impossible.¹²² The point of this standard is precisely that defensive action may be justified before the decisive act of aggression occurs, so long as the threat has reached a stage where waiting would make defense impossible or catastrophic. The moral reasoning behind this principle is straightforward: when the evidence of impending harm is sufficiently clear, the threatened state need not absorb the first blow in order to preserve its right of defense.¹²³

Climate change presents the inverse of this familiar situation. In the traditional anticipatory defense case, states act before the decisive moment because the threat is clearly developing and delay would guarantee disaster. In the climate case, the harm is already unfolding, even if the precise moment when it began, or when it crossed the threshold of war-like harm, is difficult to identify. Rising seas, desertification, salinization of freshwater systems, and the degradation of agricultural land are not speculative future harms but ongoing processes that are already undermining the territorial and material foundations of political communities. The absence of a single “Pearl Harbor” moment therefore does not distinguish climate change from war in a morally meaningful way. Rather, it reflects the fact that the aggression unfolds through slow and cumulative mechanisms rather than sudden military action.

Seen in this light, the lack of a singular starting point does not undermine the war analogy; it reinforces the central claim of this project. Climate change represents a form of structural aggression that unfolds over decades rather than hours. Just as the massing of armies can justify defensive preparation before invasion occurs, the progressive erosion of territory and habitability can justify defensive responses even when the exact moment at which the harm became intolerable cannot be

¹²¹ Daniel Webster, letter to Lord Ashburton, August 6, 1842, in *British and Foreign State Papers*, vol. 30 (London: James Ridgway, 1843), 195–196.

¹²² The Caroline incident arose during the Canadian rebellions of 1837, when British forces crossed into U.S. territory and destroyed the American steamer *Caroline*, which had been supplying Canadian insurgents. In the diplomatic furor that followed, U.S. Secretary of State Daniel Webster argued that anticipatory self-defense could be justified only when the necessity of defense was “instant, overwhelming, leaving no choice of means, and no moment for deliberation.” This formulation has since become a canonical reference point in international law and just war theory discussions of anticipatory self-defense.

¹²³ Walzer, *Just and Unjust Wars*, at 81–85.

neatly identified. The moral logic of self-defense does not depend on pinpointing a single triggering event. It depends on recognizing when a process threatens the continued existence of a political community.

An objection that cuts deeper than any of the preceding is the charge of self-undermining. If climate change really were war, then just war theory should be able to handle it without extensive modification. The very fact that I am arguing for significant revisions to JWT, particularly regarding conflicting claims of self-defense and the limits of proportionality, suggests that climate change is not actually the kind of phenomenon JWT was built to address, and that forcing it into the framework distorts both the framework and the phenomenon. This objection deserves a direct response. The claim that JWT needs revision in light of climate change does not show that climate change is not war. It shows that JWT was developed under a set of empirical assumptions about what war looks like, assumptions that no longer hold across the full range of sovereignty-threatening harms that political communities face.

Just war theory has undergone this kind of revision before. The tradition was originally built around paradigm cases of dynastic territorial conflict. It was subsequently extended to accommodate guerrilla warfare, insurgency, terrorism, humanitarian intervention, and cyberattacks, in each case requiring modifications to existing principles rather than wholesale abandonment. The need for revision did not show that terrorism or cyberattacks were not really forms of war-relevant conflict; it showed that the tradition's operating assumptions were too narrow. Climate change represents the next stage in this trajectory. The reason it creates pressure on JWT is not that it falls outside the domain of the theory. It is that it falls squarely within the domain, sovereignty-threatening harm imposed by identifiable actors, but exhibits features (diffuse causation, intergenerational timeframes, absence of hostile intent) that the tradition's inherited formulations did not anticipate. Revising JWT to accommodate these features is an extension of a long historical pattern, not evidence that the framework is being misapplied. Indeed, the alternative is worse: if we refuse to apply JWT to climate change on the grounds that it does not fit neatly, we leave the most serious sovereignty-threatening process in modern history without any normative framework designed to evaluate defensive responses to it. JST, necessity, and humanitarian rescue all have their uses, but none of them centers the defensive rights of threatened communities in the way that JWT does. The revisions I propose are not a sign that the war framing is forced. They are a sign that JWT, like any living normative tradition, must evolve to address the forms of political violence that actually confront us.

There are two additional critiques that I want to address. The first, by Rita Floyd, suggests that Just Securitization Theory (JST), not just war theory, is the proper framework for evaluating moral responses to climate change.¹²⁴ Her view is that securitization, a political move that frames an issue as an existential threat requiring extraordinary action, is better suited to non-traditional emergencies like climate change, especially where there is no clear aggressor. She argues that just war theory, with its roots in state-on-state violence, is too narrowly constructed around identifiable enemies and intentional aggression to handle diffuse, structural threats like a warming planet.¹²⁵

But while JST does offer a principled way to evaluate whether emergency action is justified, it is not clear that it replaces JWT so much as mirrors it under another name. In fact, JST borrows its core structure directly from just war theory: just cause, right intention, proportionality, legitimate authority, and last resort all reappear, rebranded but functionally similar. The difference, then, is not in the moral architecture but in the framing of the threat. Floyd wants us to treat climate change as a security crisis that authorizes exceptional governance. I want to treat it as an act of unjust aggression—or at the very least something morally indistinguishable from one—that places victim states in a position of self-defense. But in both cases, we are reaching for the same ethical machinery. The real question is not which framework is better in the abstract, but which framing more clearly captures the moral stakes of the situation and the agency of those affected.

To see why this question matters practically and not just theoretically, consider what each framework implies for a state like Tuvalu. Under Floyd's Just Securitization Theory, Tuvalu's predicament is framed as an emergency that must be managed through legitimate institutions. The question JST asks is whether it is permissible for governing authorities to treat climate change as an existential threat and invoke emergency measures. The answer may well be yes. But notice what this framing does to the moral position of the threatened state. Under JST, Tuvalu is a recipient of emergency governance. It is the object of a securitizing move, not the subject of a defensive right. The question is whether someone, perhaps an international body, perhaps a coalition of powerful states, may legitimately declare the situation an emergency and act accordingly. Tuvalu's own agency, its right to act in its own defense when others will not, recedes into the background. The framework is fundamentally top-down: it asks when authorities may invoke exceptional powers, not when victims

¹²⁴ Rita Floyd, *The Morality of Security: A Theory of Just Securitization* (Cambridge: Cambridge University Press, 2019), 5–12.

¹²⁵ *Id.* at 5–12, 68–75.

may defend themselves. Now contrast this with the just war framing. Under JWT, Tuvalu is not waiting for someone else to securitize its predicament. It holds a defensive right grounded in the fact that its sovereignty and territorial existence are under threat from an identifiable, ongoing, and unjust process. It may act, subject to *jus ad bellum* constraints, even if the international community refuses to authorize action on its behalf. This is not a trivial difference. It is the difference between a framework that asks “may the powerful act on behalf of the vulnerable?” and one that asks “may the vulnerable act on their own behalf?” Floyd’s framework is well suited to the first question. But the situation I am analyzing in this project, in which vulnerable states contemplate unilateral geoengineering precisely because the powerful have failed to act, requires the second. JST provides no account of what Tuvalu is permitted to do if securitization fails, if the international community acknowledges the emergency but does nothing, or if powerful states block collective action to protect their own interests. JWT, by contrast, provides exactly that account. It says that a state facing existential, unjust harm retains a right to defend itself, and it provides a set of moral constraints on how that defense may be conducted. The contrast I am drawing here is between the moral structures of these two frameworks, not their legal procedures; both may, in practice, route through international institutions for legal recognition, but they differ on where moral entitlement is located in the first place. That is why the war framing is not simply a matter of severity. It is a matter of who holds the moral initiative.

To put it more precisely, JWT does require a culpable aggressor, but culpability does not require hostile intent. As Walzer, McMahan, and others have acknowledged, self-defense may be justified even when harm comes unintentionally, as in the case of negligent or reckless actions that threaten sovereignty or survival, where culpability tracks the agent’s responsibility for the threat rather than any malice toward the victim.¹²⁶ Climate change, with its roots in centuries of emissions by industrialized nations, may not involve a targeted attack, but it does involve unjust harm inflicted by some on others. That is sufficient to ground claims of defensive war. Second, and more importantly, just war theory centers the agency of the defender. It is built around the idea that unjustly threatened communities may act, even forcefully, to preserve their lives, their rights, and their autonomy. JST, by contrast, is fundamentally about authorizing exceptional state power through securitization. It is a theory about when governments may override normal politics, not a theory about when victims of

¹²⁶ Walzer, *Just and Unjust Wars*, at 54.

injustice may fight back. That's a crucial difference. What I am interested in here is not whether climate change can be securitized, but whether states facing existential loss may act in defense of themselves, even if others disapprove. On that front, just war theory, especially in its modern, pluralistic forms, provides the clearest moral vocabulary we have. So, while I take Floyd's contribution seriously, I do not see JST as a competitor to JWT, but rather as a useful supplement. It helps clarify why climate change rises to the level of emergency. But once that is established, just war theory remains the best tool for evaluating what those in harm's way are permitted to do in response.

There is an apparent tension in my treatment of Floyd. I reject Just Securitization Theory as the proper framework for evaluating geoengineering as self-defense, yet I take seriously Floyd's observation that just war theory is traditionally aggressor-focused, and I concede that this creates pressure in climate contexts. The tension, however, is only apparent. My disagreement with Floyd is not about her diagnosis of the problem. She is correct that standard JWT assumes an identifiable aggressor and that climate change complicates that assumption. Where I part company is on the remedy. Floyd concludes that because JWT is aggressor-focused, we should abandon it for a framework (JST) that sidesteps the aggressor question entirely by reconceiving the issue as one of emergency governance. I conclude instead that JWT should be interpreted more broadly, as Fruh and Hedahl have begun to do, to accommodate aggressors whose conduct lacks hostile intent but produces the same normative structure as paradigmatic aggression. The aggressors, on the account I am defending, are not climate change itself, climate change is the mechanism through which the aggression operates, but the high-emitting states whose continued conduct, under conditions of established knowledge, sustains the threat.. This is not a minor interpretive adjustment; it is a substantive claim about the moral foundations of defensive rights. The right of self-defense, on the account I am developing, is grounded not in the presence of an enemy but in the presence of a serious, unjust, and continuing threat to the conditions of political survival, where identifiable actors bear causal and moral responsibility for maintaining that threat. If that account is correct, then Floyd's critique does not show that JWT is the wrong framework. It shows that JWT needs to be extended, which is precisely what this dissertation undertakes to do. Moreover, the fact that this extension is necessary is itself one of the central contributions of the project: climate change does not merely present a hard case for just war theory; it reveals that the tradition's implicit reliance on

paradigmatic interstate aggression has obscured the broader moral principle that actually underwrites defensive rights. In this way, engaging with Floyd sharpens rather than undermines the argument.

The final critique I want to address, raised by Ranjan Datta Mangat and Simon Dalby (among others), is that invoking the language of war too freely can distort moral and political judgment. This was referenced earlier when discussing the lack of a clear aggressor. They argue that “wartalk” compresses complex, cooperative global problems into militarized logics of enemies, battlefields, and victory, narrowing imagination to security and defense rather than transformation.¹²⁷ In their view, such framing risks normalizing exceptional politics—emergency measures, concentration of authority, and perpetual mobilization—without clear endpoints or accountability. Similar cautions appear in Jordan Branch’s work on cybersecurity metaphors, which shows how war language can migrate into policy domains where it obscures rather than clarifies responsibility.¹²⁸ These critiques are important, but my project uses the war analogy in a disciplined way. The claim that climate change is war, or at least morally akin to war, is not rhetorical inflation but a moral diagnosis: it names coercion, deprivation, and existential threat at a scale that just war theory is designed to address. Far from justifying a militarized response, the analogy here is constrained by just war principles themselves. It structures moral reasoning, not political command. If “war” language is used carefully, anchored in moral analysis rather than propaganda, it can illuminate rather than distort the ethical gravity of the climate crisis.

5. Conclusion

This chapter has defended the central claim introduced in Chapter 1: that climate change should be understood not merely as a policy failure or environmental tragedy, but as a form of unjust aggression, or at least as morally analogous to war in the respects that matter for normative evaluation. The argument relied on the underlying moral structure of the harms involved. When the actions of some actors foreseeably and avoidably undermine the territorial integrity, political independence, and basic survival conditions of other political communities, the resulting harm fits within the same normative category that just war theory was developed to address. The fact that the mechanism of harm operates through atmospheric processes rather than armies does not alter that structure. War

¹²⁷ Mangat and Dalby, “Climate and Wartalk,” at 3.

¹²⁸ Jordan Branch, “What’s in a Name? Metaphors and Cybersecurity,” *International Organization* 75, no. 1 (2021): 39–70, at 41–42, <https://doi.org/10.1017/S002081832000051X>.

has never been defined solely by explosions or battlefield spectacle; it has always concerned the coercive destruction or erosion of political communities.

To establish this claim, the chapter first reconstructed the argument offered by Fruh and Hedahl, showing how the possibility of justified unilateral geoengineering implies that climate change itself must possess the normative structure of aggression. It then strengthened that argument by drawing on empirical evidence regarding the vulnerability of low-lying states, legal and historical precedents concerning environmental harms, and conceptual work within the just war tradition. Finally, it addressed a series of objections—including the lack of a clear aggressor, the absence of traditional violence, comparisons to economic sanctions, and the absence of a singular inciting moment—and argued that none of these disanalogies undermine the war diagnosis once attention is focused on sovereignty-threatening harm and the destruction of the material conditions necessary for political survival.

If this analysis is correct, then the implications for moral theory are significant. Describing climate change as unjust aggression is not merely a matter of conceptual clarification. It places the problem within a framework, just war theory, that was designed to regulate the use of force in situations where political communities face existential threats. Yet climate change differs from the conflicts that originally shaped that framework in one crucial respect: the harms arise from diffuse and cumulative conduct rather than discrete hostile acts. As a result, the defensive responses that might be justified against such harms may not map neatly onto the traditional categories of the theory.

The next chapter turns to that problem directly. It begins with a brief overview of the core principles of just war theory before examining how those principles function when multiple actors plausibly claim self-defense in response to the same structural threat. In particular, it explores how the potential deployment of stratospheric sulfate injection creates a situation in which several states might simultaneously and rightfully claim defensive justification for actions that themselves impose risks on others. The possibility of conflicting claims of self-defense therefore exposes a tension within the traditional framework of just war theory, a tension that becomes the central problem explored in the remainder of this dissertation.

Chapter 3: Conflicting Claims of Self-Defense

1. Introduction

In the previous chapter I explored the idea that climate change is an unjust war.¹²⁹ I also argued that SSI would be a defense, perhaps the only defense available, for those being harmed by this unjust war. The argument in this chapter relies on the assumption that all ethical theories should be, at the very least, action-guiding.¹³⁰ Mature ethical theories might occasionally bite the bullet when presented with a tough decision, but they are able to provide an answer to what would be the proper course of action even if that answer is less than ideal or difficult to accept. Even when there is disagreement within a theory by proponents, the disagreement generally deals with ways in which an emphasis is placed within the theory and does not involve an inability to distinguish between two courses of action. Two utilitarians might disagree about the way to approach torture, but each will have an answer to what should be done, with their different answers resulting from different weights placed on the harms associated with torture, etc. In contrast, this chapter will explore the way in which climate change undermines the action-guiding nature of just war theory. Particularly, I will explore the paralyzing nature of conflicting claims of self-defense.

The concept of “conflicting claims of self-defense” is addressed by Stephen Gardiner in “The Desperation Argument for Geoengineering.”¹³¹ Gardiner writes, “The...drawback is that the right to self-defense can be (legitimately) invoked by many parties, and in different, potentially conflicting, ways. Some countries may want to defend themselves with different levels of SSI, others with rival forms of geoengineering, and many may consider being put under the yoke of an SSI regime as itself a threat that justifies self-defense.”¹³² This statement is part of a larger argument where Gardiner pushes back against claiming self-defense when implementing geoengineering, particularly when relying on emergency language. While I addressed this in the previous chapter by elevating the harms of climate change to a form of unjust war, or situating the harms from climate change in such a way that they are war-adjacent, there remains an issue, under current understandings of just war

¹²⁹ This unjust war might be “war adjacent” such that the same normative framework applies. This was explored in the previous chapter. From this point forward, the idea of climate change as war will refer to both fully embracing being defined as war or the war adjacent understanding that still requires the same treatment.

¹³⁰ Action guiding should not be conflated with motivating.

¹³¹ Gardiner, “The Desperation Argument,” at 29.

¹³² *Id.* at 30.

theory, with multiple parties claiming self-defense. With the aim of exploring this issue, I first briefly explore just war theory from both the traditional and revisionist perspectives. I then explore the different requirements within just war theory in the context of SSI being used as a justified form of defense against the unjust aggression of climate change. I finish the chapter by exploring how current understandings of just war theory fail to handle these competing claims of self-defense.

2. War Theory Overview

Just war theory can be divided into roughly two camps, traditionalist and revisionist. While these camps are not perfectly defined and there is considerable overlap, the two camps can be generally understood in the following ways. Traditionalists such as Michael Walzer tend toward a legal understanding of justice in war, attempting to apply moral justifications to international law. This tradition places an emphasis on state centric views of war, arguing that while the powers of the state might be based on individual rights, there is a disanalogy between morality as applied to individuals and morality as applied to state actions.¹³³ In this way, Walzer (and other traditionalists) would reject the ‘ninja assassin’ analogy developed by Patrick Taylor Smith (discussed in Chapter 1).¹³⁴ This view also places an emphasis on civilian immunity. Meanwhile, revisionist theories, developed by Jeff McMahan and others, question the moral foundation of the state as being distinct from the moral standing of the individuals who compose it. Revisionist theories also allow for broader understandings of non-combatant liability, as well as more permissive allowances for humanitarian intervention.¹³⁵ Within both traditions there is a generally accepted list of requirements to engage in war (*jus ad bellum* requirements), though some theorists combine or give varying weights to the requirements. These are: just cause, legitimate authority, right intention, reasonable prospects of success, proportionality, and last resort. Additionally, after engaging in a just war there are restrictions on how one may proceed (*jus in bello*), and these are listed as discrimination, proportionality, and necessity.¹³⁶

¹³³ Walzer, *Just and Unjust Wars*.

¹³⁴ Patrick Taylor Smith, “Redirecting Threats, the Doctrine of Doing and Allowing, and the Special Wrongness of Solar Radiation Management,” *Ethics, Policy & Environment* 17, no. 2 (2014): 143–146, at 145.

¹³⁵ McMahan, *Killing in War*.

¹³⁶ Seth Lazar, “War,” in *The Stanford Encyclopedia of Philosophy*, Spring 2020 ed., ed. Edward N. Zalta, <https://plato.stanford.edu/archives/spr2020/entries/war/>.

The most fundamental *jus ad bellum* requirement is just cause, typically understood as a state's moral justification for war. By far the clearest just cause is self-defense against aggression (or defense of an innocent third party). Traditionalists like Walzer ground this right in the rights of individuals that are transferred to the state. A state exists to protect its people's basic rights; when an aggressor threatens the state's sovereignty or territory, it endangers those rights, and the state not only may but indeed must defend itself on its citizens' behalf. Walzer famously equates crimes against individuals (murder, theft, enslavement) with aggressions when done to a state.¹³⁷ In this view, preserving a political community's independence (its ability to govern and protect its people) is paramount—loss of sovereignty is considered a fate as serious as mass loss of life. (As Walzer notes, conquest “erases a political community,” which is paradigmatically unjust.)¹³⁸ The obligation of a state to resist such aggression is thus the cornerstone of just war theory. Even without delving into all historical nuances, the key point is that an unjust attack on a state's basic rights (territory, political sovereignty, or citizens' lives) establishes a just cause for war: to repel the aggressor and right that wrong. This state-centric justification goes beyond individual self-defense analogies—we might say the state inherits the rights of its citizens in aggregate. For example, just as a corporation can act in ways an individual shareholder cannot, a state may wield war to protect the collective interests of its people. In short, under traditional just war theory, a state has just cause to fight when it faces unwarranted aggression that threatens its fundamental sovereignty or the safety of its population.

If we accept the framing of climate change as a form of warlike aggression, then the small island states facing climate-driven annihilation clearly possess a just cause for defensive action. From the traditionalist perspective, statehood itself is at stake—rising seas and destructive climate effects would literally erase nations like Kiribati or the Maldives, stripping away their sovereignty and dispersing their people. Protecting national survival is precisely the sort of self-defense just war theory deems a just cause. Walzer's view would recognize climate change's existential threat as akin to an armed invasion, since it coercively robs a community of its home and independence.¹³⁹ Meanwhile, revisionist theorists are generally more permissive about what counts as just cause (beyond straightforward self-defense). Jeff McMahan and others allow that war can be justified to prevent catastrophic harm or grave injustice, even in cases that traditionalists might consider internal matters

¹³⁷ Walzer, *Just and Unjust Wars*, at 51-53.

¹³⁸ *Id.* at 53.

¹³⁹ *Id.* at 53, 89.

or lacking a conventional “armed attack.”¹⁴⁰ In this vein, a humanitarian crisis inflicted by climate change (widespread death, displacement, and the collapse of a society caused by others’ emissions) could qualify as a just cause for war under a revisionist view, because it “shocks the conscience” and involves severe wrongdoing.¹⁴¹ Thus, both frameworks—albeit by somewhat different reasoning—converge on the idea that these vulnerable states have a right to use force in self-defense. Climate change constitutes unjust aggression against them (even if the “aggressors” are diffuse and indirect), and geoengineering could be seen as the defensive weapon by which they fight back. Framing geoengineering as an act of war undertaken to prevent “complete destruction” of a nation situates it firmly under just cause. In sum, for the nations most imperiled by climate change, the just cause criterion is satisfied: they are resisting a life-and-death aggression against their people’s very existence.

Proportionality is the *jus ad bellum* requirement that the overall good to be achieved by war must outweigh the expected harms.¹⁴² (There is an analogous *jus in bello* proportionality that limits how much force is appropriate in the midst of fighting.) In deciding whether to go to war, leaders must balance the injustice they aim to avert or rectify against the destruction and suffering that war will bring. If the costs of war likely far exceed the benefits (e.g. trivial gains achieved at the price of massive carnage), then the war would fail proportionality and thus be unjust. For example, declaring war over a minor offense or a single captured citizen would be disproportionate if it entails thousands of deaths. Even a just cause cannot be pursued by means that are grossly costly relative to the good achieved. Once war is underway, proportionality continues to require that each military action avoid excessive collateral damage to civilians relative to its military advantage.

In the context of climate change and geoengineering, proportionality becomes a complex and crucial question. Opponents might argue that deploying SSI could have grave side-effects—disrupting global weather patterns, harming ecosystems or communities that played no part in causing climate change. If the harms from geoengineering outweighed the harm it prevents, then using it would violate proportionality and thus not be justified. This concern is echoed in the geoengineering debate: for instance, some argue (in non-war terms) that the moral burden of actively intervening in the climate is higher than that of passively allowing climate impacts, meaning we’d

¹⁴⁰ McMahan, *Killing in War*, at 3–5, 218–223.

¹⁴¹ “Shocks the conscience” is a term from *Rochin v. California*, 342 U.S. 165, 172 (1952) that was later used by Walzer, and is now commonly used when considering humanitarian intervention.

¹⁴² Lazar, “War.”

need much greater certainty of benefit before taking such action.¹⁴³ However, reframing climate change as an act of war significantly raises the threshold of allowable harm. If the very survival of a nation is on the line, just war theory permits considerable collateral damage in pursuit of that paramount good. We accept, for example, that a nation may fight a full-scale war with all the destruction that entails, rather than be conquered and obliterated. Fruh and Hedahl illustrate this point with World War II: the devastation of a global war was considered proportional to the evil it prevented—namely, the end of free societies like England under Nazi domination.¹⁴⁴ By analogy, preventing the disappearance of an entire state is an extraordinarily weighty good, one that can justify taking on significant risks and harms via geoengineering. To put it simply, losing a nation is a harm so great that almost any lesser harm can be warranted to stop it.

Even so, proportionality demands careful comparison of harms and benefits. A traditionalist like Walzer would insist that while a state may fight for its survival, it must still try to minimize unnecessary suffering; but he would also agree that proportionality cannot require a state to passively accept its own destruction.¹⁴⁵ Revisionist thinkers tend to set stricter limits on harming innocents, raising the question of whether geoengineering’s worldwide side-effects might cross a moral line. Jeff McMahan, for example, argues there are limits to how many “unjust aggressors” one can permissibly kill even for a just cause.¹⁴⁶ In a climate war scenario, that translates to concern about harming large numbers of bystanders (people in other countries) who are not actively attacking, or who bear only minimal responsibility for the emissions. These are valid moral worries and will be examined more in Chapter 4. Even so, both just war camps leave room for geoengineering if it truly is the only way to save a state from annihilation. Traditionalists would argue that no nation can be required to sacrifice itself on the altar of proportionality, a line must be drawn where survival overrides other harms. Revisionists, while more cautious, could concede that if the alternative is national extinction, even serious collateral harms might be justified (provided every reasonable measure is taken to reduce those harms). So, proportionality remains a challenging test for climate-change-as-war, but it need not prohibit a carefully controlled SSI defensive action, especially given that the stakes (continued existence vs. obliteration) weigh so heavily on the side of taking action. This tension

¹⁴³ *Id.*

¹⁴⁴ Walzer, *Just and Unjust Wars*, at 279-283

¹⁴⁵ *Id.* at 51-59.

¹⁴⁶ McMahan, *Killing in War*. See also Thomas Hurka, “Proportionality in the Morality of War,” *Philosophy & Public Affairs* 33, no. 1 (2005): 34-66; Frowe, *Defensive Killing*.

between survival and collateral damage lies at the heart of the geoengineering debate, and I will take up these proportionality concerns in the next chapter.

The remaining requirements—legitimate authority, right intention, reasonable chance of success, and last resort—can be addressed more briefly, as they pose fewer novel problems here. Legitimate authority dictates that only proper sovereign entities can launch a war.¹⁴⁷ In our scenario, this is satisfied: the small island nations in question (Kiribati, the Maldives, etc.) are internationally recognized states with legitimate governments. They are acting as states, not rogue actors. (For example, if a private billionaire like Elon Musk unilaterally tried to deploy SSI “on behalf” of an island, that would violate legitimate authority, but a state’s decision to act in its own defense is fully legitimate.) Right intention requires that a war be waged for the right reasons, aligning with the just cause.¹⁴⁸ In this case, as long as these states undertake geoengineering sincerely to protect their citizens and homelands, and not for some hidden agenda of territorial or economic gain, their intention is pure. There is little doubt that a nation literally fighting for its survival can meet the right intention standard, their aim is to preserve their people and way of life, which is an ethically honest motive.¹⁴⁹ (Even if an action like SSI had side-benefits, say a technological or economic boost for the state, that doesn’t negate right intention so long as those benefits are side-effects rather than the driving purpose.)

Reasonable Chance of Success is the idea that one should not resort to war if defeat is virtually certain as it would only add pointless deaths to the inevitable outcome.¹⁵⁰ This criterion can be controversial: some argue that even a hopeless last stand is honorable or permissible (people have a right to resist aggression even if odds are slim), much as an individual might fight back against an attacker despite likely failure. Others hold that if victory is impossible, war is morally unwarranted because it squanders lives in vain. In the climate context, the question is whether SSI would work—if deploying solar geoengineering has virtually no chance of mitigating the climate threat in time, then it shouldn’t be attempted. However, scientific research suggests that SSI can substantially cool the planet, or at least buy critical time against warming. While uncertainties and potential side-effects

¹⁴⁷ Brian Orend, *The Morality of War*, 2nd ed. (Peterborough, ON: Broadview Press, 2013), at 38–43.

¹⁴⁸ McMahan, “The Basis of Moral Liability,” at 390–397.

¹⁴⁹ It should be noted that right intention (or more accurately the failure of right intention) is morally and functionally similar to moral corruption as discussed by Gardiner in *A Perfect Moral Storm*.

¹⁵⁰ Frowe, *Defensive Killing*, at 1–4, 27–33, 110–115.

exist, there is a realistic prospect that a well-executed SSI program could save the threatened states from drowning. Just war theory does not demand absolute certainty of success—only a reasonable probability of achieving the just aim. Given that these nations are out of alternatives, even a moderate chance of success with geoengineering arguably suffices (much as Ukraine’s initially “low” chance of repelling invasion did not preclude it from fighting, since even a slim hope is better than none).¹⁵¹

Last Resort means war should be used only when all peaceful or less extreme options have been tried or truly exhausted.¹⁵² In classical terms, a country must negotiate, appeal to international bodies, apply sanctions, or take other measures before resorting to force. For climate change, the challenge is that the “aggression” is slow and impersonal—there is no single moment when you definitively know every other remedy has failed. We won’t see enemy tanks rolling into a capital to signal a final chance to fight. Instead, the harms accumulate over years and decades. Nonetheless, we can say the last resort condition is met once it’s clear that no sufficient global action will arrive in time to save these nations. Unfortunately, that point may already have come. Despite decades of negotiations (from Kyoto to Paris), the international community has not curbed emissions enough to prevent the severe climate impacts now looming. If, after earnest attempts, mitigation and adaptation efforts are faltering and a country’s survival timeline is running out, it is justified in turning to geoengineering as the only remaining lifeline. Last resort doesn’t mean literally waiting until your capital is underwater; it means that every realistic alternative—diplomacy, economic adjustments, appeals for aid—has been tried or deemed insufficient. Given the urgency (e.g. saltwater intrusion already poisoning water supplies, or land rapidly vanishing), a threatened state could reasonably conclude that further delay is fatal, making immediate defensive action through SSI its last viable option. While concepts like last resort may need reinterpretation for a creeping threat like climate change, the spirit of the rule can be satisfied: these nations will have tried everything short of “war” and found it inadequate, leaving geoengineering as a genuine last resort to prevent catastrophe.

In summary, traditional *jus ad bellum* criteria (just cause, proportionality, etc.) suggest that a vulnerable nation facing climate annihilation would indeed have a right to war-like defense. However, this sets the stage for a new problem: what happens when multiple nations simultaneously meet those

¹⁵¹ Lazar, “War.”

¹⁵² *Id.*

just-war conditions?⁹ The next section tackles this unprecedented scenario of competing self-defense claims.

3. Conflicting Claims of Self-Defense

The first chapter explored some of the literature dealing with self-defense and geoengineering. While this chapter has referenced self-defense, it has not situated it perfectly in the various requirements of just war theory. Jeff McMahan defines self-defense as “the use of force, including potentially lethal force, intended to protect oneself (or others) from unjustified imminent harm or aggression.”¹⁵³ Meanwhile Brian Orend defines just cause as a “moral justification required for engaging in war, typically involving protection against aggression, defense of innocent life, rectification of serious wrongs, or defense of fundamental human rights.”¹⁵⁴ The most obvious connection would be to simply draw a parallel between self-defense and just cause, and for our purposes here that will work. However, it does need to be acknowledged that while self-defense is a key part of just cause, the two are not perfectly synonymous, with self-defense being a significant component of just cause, but not the sole component. Despite this worry, for our purposes here we can understand the right to self-defense having satisfied just cause, and the title of this section and chapter could just as easily be “conflicting claims of just cause.”

As I move forward to explore the concept of conflicting claims of self-defense, I am using climate change and the harms related to climate change as a driver. I am treating this as new territory, without an analogous past conflict intentionally. To my knowledge, no prior war scenario forces us to adjudicate conflicting legitimate self-defense claims in the way climate change does. Classical just war theory envisions a conflict with one side acting in self-defense against an aggressor; even in complex multi-front wars, the defensive claims align against a common enemy. We do not see two just causes directly clashing. In the climate change case, however, several nations—all innocent victims of a broader threat—might each invoke self-defense and yet come into conflict with one another’s efforts. This appears to be a genuinely novel problem that just war theorists have not had to resolve. Even if one could imagine an analogous case (none is evident in the literature), it would be an outlier. The geoengineering-as-war scenario is breaking new ground. Acknowledging this uniqueness is important: it shows that we’re not simply applying old formulas to routine facts, but rather tackling

¹⁵³ McMahan, *Killing in War*, at 8-10.

¹⁵⁴ Orend, *The Morality of War*, at 32-35.

an unprecedented ethical challenge. That challenge must be addressed on its own terms, because whether or not history offers a perfect parallel, the theoretical tools for handling multiple righteous defenders are underdeveloped. In short, conflicting self-defense claims present a *sui generis* problem for just war theory—one that we must settle in order to understand the permissibility and limits of geoengineering as self-defense.

Before moving on to a more detailed examination of self-defense within just war theory, there are a couple of objections to using the self-defense framework that should be addressed. These objections are rooted in moral frameworks outside the just war tradition and come from discussions of climate change ethics. One potential objection is that perhaps large-scale geoengineering, such as SSI, could be implemented in a way that benefits all or nearly all states—or at least does not harm any particular nation. For example, Toby Svoboda argues that a carefully calibrated SSI program might “reduce many of the...risks of climate change” that disproportionately threaten low-emitting, vulnerable populations.¹⁵⁵ In theory, such solar geoengineering could act as a global improvement, warding off climate catastrophes for everyone and thus, some suggest, defusing the analogy of climate change to an unjust war. Indeed, applying just war principles, some have claimed that any “just geoengineering” must not sacrifice some populations for others: the intervention “must yield greater good than harm globally (not just to the country deploying it)” and cannot benefit one state’s citizens “at the environmental expense of others.”¹⁵⁶ This idealized scenario portrays SSI as a kind of benign defense—a technological shield that protects without wounding, thus there would be no need to worry about conflicting claims of self-defense since this singular defense is defending everyone. The challenge as stated combines two distinct questions, which I want to separate: an empirical question, whether SSI can in fact be implemented in a way that benefits all or nearly all states without imposing significant harms on any; and a normative question, whether, if such an implementation were possible, it would defuse the war-and-self-defense framing developed in the earlier chapters. The response below addresses the empirical question first and the normative question second. On the empirical question, this view is mistaken and largely underdeveloped. It downplays the profound

¹⁵⁵ Toby Svoboda, Peter J. Irvine, Daniel Callies, and Masahiro Sugiyama, “The Potential for Climate Engineering with Stratospheric Sulfate Aerosol Injections to Reduce Climate Injustice,” *Journal of Global Ethics* 14, no. 3 (2018): 353–368, at 365.

¹⁵⁶ Elizabeth L. Chalecki and Lisa Ferrari, “Engineering the Climate—or Deploying Disaster? Applying Just War Theory to Geoengineering,” *New Security Beat*, June 25, 2018, <https://www.newsecuritybeat.org/2018/06/engineering-climate-or-deploying-disaster-applying-war-theory-geoengineering/>.

uncertainties and uneven impacts inherent in geo-engineering. Even proponents admit that SSI carries its own risk of injustice, including potential shifts in regional precipitation or other side-effects. The hope that no state will be left worse off strains credulity given our limited predictive power and the deeply unequal world into which such technology would be deployed. Indeed, Gardiner cautions that the paradigm case of SSI “does not fit the canonical technical definition of a global public good ... more importantly, the public-good framing is seriously misleading, in part because it arbitrarily marginalizes ethical concerns.”¹⁵⁷ While Morrow contests this by arguing geo-engineering meets non-rivalry and non-excludability criteria, the disagreement itself highlights that the governance, justice and global legitimacy of SSI remain unsettled.¹⁵⁸ The allure of universal benefit thus masks deeper moral complexity. Turning now to the normative question, even granting the empirical possibility for the sake of argument, the geo-engineering-as-panacea argument is irrelevant to my central claim: the high-emitting states' continued conduct, under conditions of established knowledge, is a coercive imposition of grave harms on the innocent, an unjust war by any reasonable definition. Pointing to a speculative future fix does nothing to absolve their present aggression against vulnerable nations. Climate change is the mechanism of harm; the high-emitting states are its authors. A hypothetical future technology that might one day blunt the mechanism does not retroactively undo the wrong of having produced it. In short, the “no-harm” SSI scenario remains a remote outlier in the literature on climate ethics. Virtually all serious analyses—including those invoking just war theory—acknowledge that solar geo-engineering at best poses a lesser evil, not a risk-free salvation. A second objection comes from Stephen Gardiner who has raised serious doubts about invoking national “self-defense” to justify unilateral geoengineering. He notes that the right of self-defense, even if applicable, comes with “sharp limits”: an agent must use the least harmful means and only as a true last resort.¹⁵⁹ In the climate context, Gardiner finds it ethically troubling to imagine a single generation of leaders from one small island nation unilaterally altering the global climate for centuries to come on the basis of self-defense. Such a scenario runs up against fundamental concerns of legitimacy and intergenerational justice. After all, geoengineering deliberately inflicts foreseeable harm on others, including innocents and future people, which makes it very different from the unintended side-effects

¹⁵⁷ Stephen M. Gardiner, “Why Geoengineering Is Not a ‘Global Public Good,’ and Why It Is Ethically Misleading to Frame It as One,” *Climatic Change* 121, no. 3 (2013): 513–525, at 514.

¹⁵⁸ David R. Morrow, “Starting a Flood to Stop a Fire? Some Moral Constraints on Solar Radiation Management,” *Ethics, Policy & Environment* 17, no. 2 (2014): 123–138.

¹⁵⁹ Gardiner and Weisbach, *Debating Climate Ethics*, at 123–124.

of emissions. Gardiner observes that many are “appalled” at the prospect of turning the planet’s climate into a domain of ad-hoc human control, and “shocked” by the suggestion that we develop frameworks for a “just” geoengineering policy.¹⁶⁰ In his view, getting to a point where one small group may decide the climate future of all humanity—even with good intentions—represents a moral failure rather than a triumph. At minimum, Gardiner urges, we should resist any approach that gives a few actors carte blanche over the global climate under the banner of self-defense.¹⁶¹ The burden of justification in such an extreme case is extraordinarily high, and Gardiner is skeptical that the self-defense argument can meet it. In principle, I agree that under normal circumstances no single nation (let alone a single generation of its leaders) should have the right to unilaterally reengineer the global climate. Such an awesome power over others violates our usual ideals of collective decision-making and restraint. However, the present situation is anything but normal. The sad reality is that the global climate is already being changed, not by the small island state, but by the accumulated emissions of the rest of the world. In effect, high-emitting countries have for years been unilaterally altering the atmosphere, imposing grave risks on vulnerable nations without their consent. This observation does not, by itself, license the vulnerable state to impose further risks on innocent third parties, that question belongs to proportionality, which I take up in Chapter 4. What it does establish is narrower: a vulnerable state engaging in SSI is not the party that initiated atmospheric alteration; it is responding to an ongoing one. In this light, a geoengineering intervention by a low-emitting, at-risk nation is not a wanton bid for power but a desperate act of self-preservation. In other words, a defensive response to an ongoing assault. This defensive measure targets a harm (excess greenhouse gases) for which the vulnerable nation bears little responsibility, and it aims to prevent catastrophic losses (sovereign territory, fresh water, lives) that would otherwise occur. Given our moral framework so far, which treats climate change akin to an unjust war, the embattled island state’s resort to geoengineering can be seen as analogous to the last stand of a defensive war. If we view the major emitters’ continued pollution as an unjust aggression, then the victim state’s drastic countermeasure carries a strong moral justification. Gardiner’s own concerns underscore that any self-defense must truly be a last resort, and here it is. All less harmful avenues (emission cuts, international aid) have either failed or are coming too late. By stepping in to cool the planet, the vulnerable nation is trying to undo or reverse a harm that others have imposed on everyone. This is a far cry from an aggressor remaking the world

¹⁶⁰ *Id.* at 128.

¹⁶¹ *Id.*

for gain; it is the climate-defense equivalent of a life-or-death act. Of course, such an extreme remedy should pain us, as Gardiner rightly notes.¹⁶² But that moral discomfort does not equal wrongdoing when the alternative is annihilation. In summary, while ordinarily no one should single-handedly “play God” with the climate, here the world’s most vulnerable are effectively fighting for their lives with the only tool available. In the grim context created by the big polluters, a unilateral defensive geoengineering project, though lamentable, appears morally permissible, and even commendable, within our just-war ethical framework.

With the elements of *jus ad bellum* explored to some degree, and some potential objections to using the language of self-defense addressed, the possible application of just war theory in relation to SSI now comes into focus. What then, are the problems? I will start by exploring how the *jus ad bellum* requirements apply to the three categories of states introduced in Chapter 1: high-emitting, gray-area, and vulnerable. High-emitting states, as we will see, fail the requirements clearly and from multiple directions. Vulnerable states satisfy them clearly. Gray-area states satisfy them in some respects and not in others, and it is here that the *jus ad bellum* analysis becomes most contested. The cases of Qatar, India, and the Maldives, respectively, will illustrate each category.

The quickest and easiest example of a state in the first category is the United States, and most often when the ethical and legal nature of SSI utilization is discussed it is with the United States in mind. It is obvious that the United States does not meet the requirements of *jus ad bellum*. The just cause requirement in the context of the United States is roughly the objection that Gardiner has when discussing the idea of using SSI as a form of self-defense.¹⁶³ Additionally, it is not obvious that the U.S. meets Gardiner’s other objection—namely, the last resort requirement. This vein of thought that “there must be something else we can do that is less risky” is an argument that underlies many objections put forth for SSI in general. Gardiner is certainly not alone in this worry, as many others view SSI as the very last option. For example, David Morrow argues in favor of Carbon Dioxide Removal (CDR) technologies over that of SSI.¹⁶⁴ The idea being that SSI is too risky, and there is a

¹⁶² *Id.*

¹⁶³ Gardiner, “The Desperation Argument,” at 30.

¹⁶⁴ Morrow’s arguments were presented at the University of Washington and were in the context of arguing for expanded CDR. He acknowledged that SSI might be necessary at some point, after much more research, but at this time it is too risky and the focus should be on mitigation technologies and CDR. See: David R. Morrow et al., *Why Talk about Carbon Removal?* (Washington, DC: Institute for Carbon Removal Law and Policy, American University, 2018), <https://doi.org/10.17606/M6H66H>.

better alternative that should be explored (and that is CDR). The United States is certainly in a position to spend the money and resources on this sort of technology. The conclusion here is that the United States obviously fails to meet *jus ad bellum* requirements from multiple directions. However, this point is moot because the United States would never invoke self-defense or characterize climate change as a form of war if it implemented SSI. There are other states that stand on morally weak foundations that could conceivably (though not likely) take this path. Consider, for example, the case of Qatar.

As of 2018, Qatar had the highest per capita CO₂ emissions of any state in the world at 32.4 metric tons per capita. They have held this dubious distinction for the entirety of this century. What is more, they are an exceedingly rich country as well as a low-lying country. Qatar ranks among the wealthiest countries in the world. Combined with being one of the lowest-lying states—averaging only 28 meters above sea level and consisting of 27 islands exposed to the ocean—it provides an ideal example of a nation that would benefit from SSI and possesses the financial resources to implement it.¹⁶⁵ It is easy to see that Qatar is on the same level as the United States with regard to justification for SSI use. They would not be able to satisfy just cause for much the same reason. They are a major contributor, being the top per capita emitter, but their wealth is also based on their massive oil reserves. They cannot use SSI as a form of self-defense against a harm they themselves benefited from causing. What is more, they likely have the wealth to implement other mitigation strategies, so SSI is not a last resort.

The second group of states is the most difficult to assess. These countries fall into a grey area—they might or might not be justified in using SSI, depending on the context and the identities of those who could be harmed by its implementation. India is a prime example of this category. While India ranks third globally in total carbon emissions, behind only China and the United States, its per capita emissions remain in the bottom 25% of countries due to its large population. India clearly suffers climate-related harms, such as disruptions to its monsoon seasons, causing drought in some areas and severe flooding in others. The key question is whether these harms justify a claim of self-defense given India's significant total carbon emissions. Viewed purely through the lens of self-defense against climate change-related harms, India's claim appears to be on sound just cause footing.

¹⁶⁵“Qatar: Geography, Maps, Flag,” *WorldData.info*, accessed April 8, 2024, <https://www.worlddata.info/asia/qatar/index.php>.

However, it's less clear whether just cause would be satisfied when considering the potential harm to 'climate-change-innocent' states, those historically and presently low in both aggregate and per capita emissions. Moreover, it is uncertain whether a country as large as India could satisfy the requirement of last resort.

Other states that also fall into this second category of grey-area states are those that were past high emitters but are now attempting to responsibly fight climate change. We can imagine that some northern European states fall into this category. The issue here is that even if they are now (or soon will be) acting as responsible climate change actors, in the past they were not. What is more, they benefited from the economic advantages of abusing their carbon budget for many years.¹⁶⁶ How should this group be adjudicated? Current citizens could rightly point out that they are doing the right thing, making changes and feeling the pain of concessions, and they have a right to defend themselves against the damages of climate change. This is a small part of the intergenerational complexity of climate change that is part of Gardiner's perfect moral storm.¹⁶⁷

The final set of states is comprised of those states that are the victim states of climate change harms. These are the states that are at or below their carbon budget, considered with reference to both per capita emissions and emissions in the aggregate. What is more, these states have historically been below their carbon budgets and will remain so. Finally, these are the states most at risk—whether from rising seas that erase land entirely, the salinization of aquifers essential for irrigation and drinking water, shifts in ocean currents due to polar ice melt that disrupt fisheries and agricultural weather patterns, or extreme weather events that render large areas uninhabitable. These are states such as the previously referenced Republic of Maldives, or Kiribati, or Tuvalu. All of these nations are at risk of being slowly swallowed by the sea. Even if not literally submerged, they are at risk of seeing their drinking water become unpotable and their fisheries disappear. These may also be states such as Pakistan or Malaysia, who are not at risk of being swallowed beneath the waves, but are suffering catastrophic storms and flooding that are being called historic, except there is no point

¹⁶⁶ Simon Evans, "Analysis: Which Countries Are Historically Responsible for Climate Change?" *Carbon Brief*, October 5, 2021, <https://www.carbonbrief.org/analysis-which-countries-are-historically-responsible-for-climate-change>.

¹⁶⁷ Gardiner, *A Perfect Moral Storm*, at 32.

in recorded history that events such as these have happened.¹⁶⁸ In short, these are the states that are the most vulnerable while at the same time the least to blame for anthropogenic climate change.

This group appears to satisfy all the *jus ad bellum* requirements of just war theory. Just cause would be satisfied so long as these states were using SSI as a form of self-defense against the harms of climate change. The other contentious requirement that high-emitting and rich countries like the United States fail to meet is last resort. As previously mentioned, while this is a concern you cannot simply require that a state keep trying one more thing until they cease to exist. These states are already suffering the damages from climate change, if we direct the analogy back to conventional warfare, the bombs are already falling and causing damage. However, it is important that we examine how these states and their actions affect other states. That is, the actions do not happen in a vacuum where it is the state versus the environment, so there must be some concern for other states. To sort this, let us use an unlikely but not completely outlandish set of scenarios. These scenarios use the Maldives as a motivator (in no small part because of the previously mentioned quote). But any number of states could be substituted that are at risk due to climate change and bear little responsibility (states from our final category above).

In the somewhat near future, the effects of climate change are ever more evident, but the world as a whole still fails to act in a decisive manner. The Republic of Maldives finally adopts the “f--- you!” attitude and decides to go it alone with SSI. Aided by various independent parties (Elon Musk buys an island, etc.) they start pumping sulfates into the atmosphere, launching routine flights several days each week. There is worldwide public outcry, but at first no one reacts (perhaps many are secretly glad to see how the worldwide experiment works). However, less than two years later there is a very wet winter in North America, followed by a summer jet stream that settles over the southern portion of the United States. The result is a flood roughly equivalent to or slightly larger than the 1993 Mississippi River flood. The loss of life is somewhat minimal, but the damage is in

¹⁶⁸ “‘Surprise’ Urban Malaysia Floods Drive Pleas for Climate Action,” *Eco-Business*, May 4, 2022, <https://www.eco-business.com/news/surprise-urban-malaysia-floods-drive-pleas-for-climate-action/>; World Weather Attribution, “Climate Change ‘Likely’ Increased Extreme Monsoon Rainfall Flooding Highly Vulnerable Communities in Pakistan,” September 14, 2022, <https://www.worldweatherattribution.org/climate-change-likely-increased-extreme-monsoon-rainfall-flooding-highly-vulnerable-communities-in-pakistan/>.

the billions.¹⁶⁹ During this same time frame, the monsoons also shift for India, creating catastrophic floods in some areas and drought in others, and several countries in North Africa also experience extreme drought. Finally, while the Maldives chose global level SRM in the form of SSI, several other island nations pursued more localized geoengineering, such as marine cloud brightening, to protect their local fisheries and this is undermined by the actions taken by the Maldives.¹⁷⁰

As mentioned at the start of this chapter, with any ethical theory we expect just war theory to be action guiding. In the case of just war theory, we also expect that when there is a conflict it will tell us which state acted justly and which state acted as an aggressor. The first conflict is fairly straightforward. In the case of the Maldives versus the United States, just war theory should tell us that the Maldives is a just actor, and any aggression (shooting down the planes, blockading the islands, etc.) by the United States would be an unjust action. The underpinning of just cause for the Maldives is that they are not responsible for the harm being done to them, while the United States is a major factor in that harm. The Maldives has a per capita CO₂ of around 3 metric tons per capita while the United States is over 16 metric tons per capita.¹⁷¹ According to traditionalist interpretations of just war theory, the Maldives are justified in their action to protect their sovereignty, and it is unlikely that this just cause will be undermined by proportionality constraints. Similarly, the revisionist theories will allow that such actions taken in self-defense are appropriate. In trolley speak, this is the equivalent of the potential victim of a runaway trolley remotely triggering a switch that will save him from certain death. Instead, the trolley travels down a different track and harms (but does not kill) one of the people responsible for the trolley brake failure. The second case is more complex. This case would be the Maldives versus India (or North African countries faced with drought, etc.). While the previous case involved rich, powerful, abuser of the carbon budget versus a small, relatively weak country, with a carbon budget in line with what is needed to slow climate change, this case is decidedly different. India is certainly a major source of carbon in the atmosphere, but this is due to

¹⁶⁹ The 1993 flood caused approximately 50 deaths and damages were estimated at 15 billion dollars. See Lee Larson, “The Great Flood of 1993,” *Northwest River Forecast Center, NOAA*, accessed December 12, 2023, https://www.nwrfc.noaa.gov/floods/papers/oh_2/great.htm.

¹⁷⁰ Perhaps by disruption of the tropospheric ozone levels and increased air pollution. See Lili Xia, Paul J. Nowack, Simone Tilmes, and Alan Robock, “Impacts of Stratospheric Sulfate Geoengineering on Tropospheric Ozone,” *Atmospheric Chemistry and Physics* 17 (2017): 11913–11928, <https://doi.org/10.5194/acp-17-11913-2017>.

¹⁷¹ See World Bank, “CO₂ Emissions (Metric Tons Per Capita),” accessed November 28, 2023, <https://databank.worldbank.org/metadataglossary/ida-results-measurement-system/series/EN.ATM.CO2E.PC>.

the large population size not the per capita emissions. India actually ranks well below the Maldives when considering a per capita comparison. Likewise, the North African countries affected by the drought in 1993 and envisioned to suffer the drought in this scenario are also well below the Maldives in per capita carbon emissions.¹⁷² Here, if we rely on a sovereignty-heavy approach to establishing just cause, we are left with the distasteful image of carbon-innocent countries being harmed without any potential recourse. It might be the case that while India or other affected countries are not justified in blocking the Maldives, they are instead owed compensation for their harm by the United States and other high-polluting countries. Still, there remains the specter of allowing one state to defend itself from an aggression and disallowing another state from defending itself against the very same aggression. As such, a traditionalist must generally accept that India has just cause to shoot down the Maldives' tankers as they fly across the Indian Ocean.

Before turning to the revisionist treatment, the parties in the climate case bear naming so that the analogies that follow have firm referents. The aggressors are the high-emitting states whose emissions sustain the threat. The defender is the vulnerable state, the Maldives, on the running example. The third party is whichever innocent state would be harmed by the defender's chosen response: in the realistic version of the case I have been developing, India or a North African state experiencing drought as a side effect of the Maldives' SSL. With those roles in view, revisionist theories tend to take the opposite view, framing the debate in terms of innocent bystanders and innocent attackers. McMahan (echoing a widely held view) argues that it is not morally acceptable to submit innocent bystanders to direct harm.¹⁷³ This is argued in various ways, but we can consider it like this: If someone fires a gun at me, it is impermissible for me to grab the woman standing beside me and use her as a shield, ensuring her death but saving my own life. In our climate change scenario, a deliberately stylized version of the worry might run as follows: imagine the Maldives somehow forcing the entire population of Iceland to trade places with their own populace, the Maldives' people now safe in Iceland, the Icelanders soon to be swallowed by the rising seas. The example is bizarre by design, no more bizarre than the situation a project on the existential erasure of states must be willing to confront. It differs from the realistic case in one respect that will matter later: here Iceland is being used as a shield in the McMahan sense, whereas in the realistic case India

¹⁷² *Id.*

¹⁷³ I use the term "direct harm" here because innocent bystanders may be harmed incidentally, if that harm passes the proportionality case. There is a related discussion on this topic explored by David Morrow. See Morrow, "Starting a Flood"; see also Smith, "Redirecting Threats."

is harmed as a foreseen side effect of the Maldives' SSI rather than as a deliberate substitution. That distinction belongs to proportionality, taken up in Chapter 4. For present purposes, both versions raise the same underlying question, whether a defender's right of self-defense extends to actions that impose harm on parties who themselves did nothing wrong.

McMahan takes this a step further and concludes that innocent attackers are also exempt from attack. For this argument, innocent attackers are those that are excused but not fully justified. Examples are coerced victims, unwitting aggressors such as soldiers on the unjust side of a war, or accidental attackers such as Ness attacking Al Capone's brother on accident (e.g., a lawman mistakenly shooting the wrong target). The reasoning here is that the same sort of theoretical concerns that keep us from harming an innocent bystander also apply to an innocent attacker.¹⁷⁴ Helen Frowe provides additional support for this view in her exploration of what she calls a "requirement thesis." This thesis argues that you are morally required to act upon lesser-evil justifications.¹⁷⁵ Returning to trolley problems, for Frowe the pedestrian is required to flip the switch and save the five workers. What is more, if the single workman in the other tunnel could save himself by throwing a grenade and derailing or destroying the trolley after it was headed down his track, but it would also kill the pedestrian who was required to flip the switch, then the workman should not throw the grenade. The idea here is that one should not be liable to be killed for doing what one was morally required to do. The end result for the second case is that either we accept that the Maldives can be attacked for acting justly or else that innocent countries affected by their actions are not allowed to defend themselves against the same sort of activity that justifies the Maldives in acting.

The final case, the most problematic for just war theorists, is the case argued by Stephen Gardiner in "The Desperation Argument for Geoengineering" and quoted at the start of the chapter.¹⁷⁶ In this scenario we imagine that the Maldives decides on a particularly aggressive implementation of SSI to arrest the rising sea level. However, various other countries, themselves victims of climate change facing severe harms, even state loss, also begin pursuing SSI or related geoengineering measures. Each of these countries has a claim of self-defense and the right to pursue

¹⁷⁴ Jeff McMahan, "Self-Defense and the Problem of the Innocent Attacker," *Ethics* 104, no. 2 (1994): 252-290.

¹⁷⁵ Helen Frowe, "Lesser-Evil Justifications for Harming: Why We're Required to Turn the Trolley," *The Philosophical Quarterly* 68, no. 272 (2018): 460-480.

¹⁷⁶ Gardiner, "The Desperation Argument," at 30.

SSI and related technologies as remediation. This scenario seems to be a problem for both the traditional interpretations of Walzer, as well as the revisionist theories. Under Walzer, there is the right to defend against the risk of complete loss of sovereignty, but it seems as though other countries might have a defensive claim against the state trying to defend against this loss. That is, the right that the Maldives is pursuing is not just the right to fly tanker loads of sulfate and expel them into the atmosphere. The right is to *successfully* implement an SSI regimen that will protect them against climate change related harms. Other states also trying to implement conflicting forms of SRM are essentially attacking the Maldives' efforts. Yet those other states have the same rights and claims as the Maldives.

From the revisionist point of view, it is not much better. Jeff McMahan, when arguing his revisionist theory, puts the burden of justification for fighting not only the state, but also on the individuals engaged in the fight. He rejects the idea that soldiers fighting on the unjust side of a war can fight justly. That is, if you are on the unjust side of a war, it does not matter how honorable you conduct yourself (sparing civilians, etc.) because your particular moral standing was poisoned from the outset.¹⁷⁷ This is supposed to restrict the number of just wars fought, because in any single war there is always a just side and an unjust side. Therefore, we start with the fact that 50% of the individuals fighting should not be fighting, considered in the historical aggregate. When we also consider that some individuals on the 'right' side of a conflict have historically violated *jus in bello* principles, it becomes clear that, on average, far fewer than half of the soldiers involved in any given conflict were fighting a just war. Once we factor in the difficulty of knowing the true state of affairs as a rank-and-file soldier, it is the case that in nearly every war no soldier should feel confident in fighting justly. However, with SRM we seem to have the opposite problem. That is, we could end up with multiple parties, all of whom are justified according to established theories, but on opposing sides of the conflict.

Before raising my own concerns about revisionist approaches, it is worth pausing to develop why these frameworks might initially appear especially well-suited to the climate case. Traditionalist accounts struggle with climate change precisely because they were developed for paradigmatic cases of state-on-state aggression: an identifiable hostile party, a discrete act of force, a clear declaration of

¹⁷⁷ Jeff McMahan, *The Ethics of Killing: Problems at the Margins of Life* (Oxford: Oxford University Press, 2002).

intent. Climate change has none of these features. The harm is produced by millions of dispersed actors across decades; no one declares war; and even the most heavily implicated states can plausibly claim that their emissions, taken in isolation, were not by themselves sufficient to produce the catastrophe. On a traditionalist framework, this looks less like aggression and more like collective misfortune.

Revisionism, by contrast, was developed precisely to handle such complications. Where traditionalists derive permissions to use force from the rights and obligations of states, revisionists derive them from the rights and obligations of individuals. That individualist foundation has several features that look tailor-made for the climate case. First, it does not require a single, discrete aggressor; liability tracks contribution to a wrongful threat, and contribution can be distributed across many parties. Second, it accommodates degrees of moral responsibility through concepts like minimal responsibility, partial liability, and shared culpability, each of which has a natural application to a problem produced by cumulative action across populations and decades. Third, it allows for defensive force directed at parties who lack hostile intent but who have nonetheless culpably maintained risk-imposing conditions—precisely the situation of high-emitting states under conditions of established climate science. Put differently, the revisionist apparatus gives us tools that the traditionalist framework simply does not have: a vocabulary for moral responsibility under diffuse causation, proportionality constraints calibrated to degrees of culpability, and defensive permissions that do not depend on locating malice that does not exist. On a first pass, revisionism seems to offer exactly the conceptual vocabulary the climate case requires, and any account that seeks to move beyond it, as mine ultimately will, owes that framework its due.

While I am challenging revisionist thinkers like McMahan and Rodin, they are not merely obstacles to my view—they also offer insightful frameworks for understanding the moral structure of the climate conflict. McMahan’s idea of “minimally responsible aggressors,” for instance, closely parallels the situation of climate change.¹⁷⁸ The threat to island nations arises from countless individuals and states who, while contributing to the problem, lack malicious intent and bear only partial responsibility. This diffuse culpability is exactly the kind of case McMahan’s model addresses. It tells us that any defensive harm we inflict (through SSI’s side-effects) is aimed not at evil aggressors, but at people who are mixed in moral status, somewhat like bystanders, yet causally involved. That

¹⁷⁸ McMahan, “The Basis of Moral Liability,” at 390–397.

insight does not mean the threatened state must surrender, but it raises the moral bar for justified defense: we must show that the harm we prevent (losing an entire nation) truly outweighs the unintended harms we cause. Rodin's arguments similarly remind us that when defensive action injures many who are largely innocent, we may need to treat it as a tragic "lesser evil" rather than a straightforward right.¹⁷⁹ This perspective encourages moral humility: a state like Kiribati can assert its right to self-defense, but it should also acknowledge the gravity of harming others and proceed with regretful necessity rather than triumph. Even Thomas Hurka, who often defends more traditional just war principles, agrees that strong proportionality constraints (especially regarding harm to innocents) remain in force.¹⁸⁰ Hurka's view reinforces my claim that geoengineering, if undertaken, must be done with the utmost care to minimize collateral damage. In sum, engaging these revisionist models more deeply actually strengthens my position. Even when their modified views are taken into account, the issue still remains.

The issue, of course, is that there are multiple innocent states that end up at odds with each other. If we choose a version of just war theory that admits that both innocent states have the right to defend themselves, then just war theory has told us nothing at all. How can it be fair that a state justified in defending itself is also liable to attack for the very same defense that it was justified in using? Or to be liable to harm for having taken an action that, while it caused incidental harm to third parties, satisfied the conditions of self-defense given that the alternative was annihilation? This is not the familiar case of a defender being told that no proportionate response is available. What is novel here is that two parties each have just cause whose exercise harms the other, a configuration the tradition has not, to my knowledge, addressed. Meanwhile, it seems even more egregious to tell two states, "Sorry, neither of you can do anything to save yourselves. You would harm the other and are therefore required to fade into oblivion due to the transgressions of an entirely different group of states."

4. Why Standard Solutions Fail

There are several potential responses to the issues raised above and they were mentioned in passing earlier in this chapter as well as in Chapter 1. Consider the arguments presented by David Morrow and expanded on by Patrick Taylor Smith. Morrow explores the use of SRM in light of the

¹⁷⁹ David Rodin, "Justifying Harm," *Ethics* 122, no. 1 (2011): 74–110, at 89–96.

¹⁸⁰ Hurka, "Proportionality in the Morality of War," at 35–41, 63–65.

doctrine of double effect and the doctrine of doing and allowing. He points to a “special wrongness” of SRM that focuses on the use of SRM by high emitting states such as the United States, and this special wrongness elevates the needed benefits for the doctrine of double effect and for doing and allowing.¹⁸¹ This particular angle will be explored in detail in the next chapter as it is just another way of articulating proportionality. However, there is relevance with regard to self-defense, in particular when considering the doctrine of doing and allowing.

Recall that Smith made a distinction between what is an accident and what is a redirection. The important moral issue here is that redirection involves intentionality.¹⁸² So, while there has certainly been a moral failing with regard to the climate, much of it falls under the scope of accident (at least historically, there is a strong argument to be made for intentionality the last 20 years). A state such as the Maldives engaging in SSI that they know will undermine another state’s efforts to defend against climate change would not be accidental. This would involve a level of intentionality that raises the moral weight. It may potentially raise the moral weight to the level of impermissibility, though this would likely again be an issue of proportionality. Smith suggests that even outside of proportionality constraints, such an action could potentially be morally untenable.

Addressing Smith’s analogy once again, he articulates the idea that if you shoot a gun trying to defend yourself against an assassin and your bullet travels through the nearby apartment wall and kills your neighbor instead (or as well), then that situation falls under the label of accident.¹⁸³ The harm was not intentional and not reasonably foreseeable. On the other hand, if you attempt to avoid the assassin by swapping your apartment number with the apartment number of your neighbor, then the neighbor’s death is intentional. Your “self-defense” was just you being willing to sacrifice your innocent neighbor to save yourself. Even if you are being unjustly targeted, you do not have a self-defense claim that allows you to sacrifice your neighbor’s life to save your own. Mapping this analogy onto climate change, we can conclude that even though the Maldives is being unjustly harmed by climate change, they do not have the right to engage in some activity that undermines the existence of another innocent state.

¹⁸¹ Morrow, “Starting a Flood.”

¹⁸² Smith, “Redirecting Threats.”

¹⁸³ *Id.*

I see two potential answers to the worries stated above. First, if we view the problem from the traditionalist approach, then sovereignty comes into play. When a state acts in self-defense, there is a greater burden on the state than on the individual. That is, there is a breakdown in the analogy between individual self-defense and state level self-defense. A state has a higher moral burden because it is not allowed to sacrifice itself, while a person is allowed such a move. I can choose to give my own life in defense of another. We generally call people courageous or even heroes. However, the state does not have the same “right” to sacrifice itself to save others (the others here being another state or citizens of another state). Instead, a state is required to prioritize its own members over other states, and over the well-being of members of other states. Recall that the closest non-state analogy that we had to the relationship of citizens and the state was a corporation and shareholders. The same way that a corporation cannot decide to stop doing business, sell off its assets, and donate them to a rival, a state cannot decide to ignore the needs of its own citizens while prioritizing the citizens of another state.¹⁸⁴

This asymmetry between individual and state-level self-defense deserves a closer look, because it does substantive work in the argument. An individual contemplating self-sacrifice is contemplating the disposition of her own life, a life she has standing to give. Even where we admire such sacrifice, what makes it permissible is precisely that the loss falls on the agent making the choice. The state’s situation is structurally different. When a state contemplates “sacrificing itself,” it is not contemplating its own loss; it is contemplating losses that will fall on its citizens, who have not chosen the sacrifice and who, on most theories of political authority, are owed protection rather than disposal. A government that “opts out” of protecting its population in deference to others’ welfare is not acting heroically; it is failing in its constitutive duty.

This is not merely an analogy from corporate fiduciary obligation, though that analogy holds. It is grounded in what we take political authority to be for. Whether one follows Hobbes in deriving authority from the consent of those who entrust their security to the sovereign, Locke in deriving it from the limited grant of natural rights, or modern republican accounts that derive it from the protection of basic political agency, the structure is the same: states exist, in significant part, to provide the protection that individuals cannot reliably provide for themselves. To “opt out” of that function is not to exercise a moral prerogative; it is to abandon the basis on which the state’s authority rests.

¹⁸⁴ This is explored in more detail in the next chapter.

A state may sometimes lack the means to discharge its protective duty, but that is not the same as electing to forgo it. The asymmetry between individual and state-level self-defense, then, is not a contingent feature of political life. It is a structural feature of what states are.

A second potential answer is that even if we do not take a strong sovereignty approach to the issue, there is still another issue with applying Smith's concerns to this issue. There is an important difference between Smith's analogy (and the underlying concerns) and what is happening with conflicting claims of self-defense. It is not the case that we have an aggressor A, a victim V, and an innocent, unaffiliated third party I, where A is attacking V and V is using I as a means of defense or escape.¹⁸⁵ This is the story with Smith's analogy. Instead, a cleaner analogy is that we have an aggressor A, and multiple victims V1 and V2, where both are attempting to save themselves and end up undermining each other. My claim with regards to the shortcomings of just war theory is that we have this second scenario, and the just cause/self-defense clause is simultaneously being satisfied and disallowed.

There is a forceful version of this concern that needs to be considered. One might argue that there is nothing paradoxical or broken about just war theory telling a state that it may not act. JWT has always imposed limits on defensive action. A state facing an unjust invasion may not, for example, repel the invader by deploying biological weapons against civilian population centers in a third country. That is not a failure of just war theory; it is the theory functioning as designed. If a state cannot defend itself without redirecting serious harm onto an innocent third party, then perhaps the morally correct answer is that the state must bear the loss. The objection deserves a direct response. I concede the general principle: just war theory does, and should, sometimes tell states that they may not act. The question is whether this is one of those cases. There is an important structural difference between the standard case and the climate scenario. In the standard case, the defender has an identifiable aggressor against whom force may be directed, and the constraint is that defensive action must not spill over disproportionately onto uninvolved third parties. The defender is limited, but the defender has a target. In the climate scenario, there is no such target. The victims cannot direct force at the source of the threat in a way that resolves it, because the threat is atmospheric and diffuse. Every available defensive option, including SSI, necessarily operates on the shared global

¹⁸⁵ This particular analogy is likely relevant in many scenarios that face SSI, but these cases fall more neatly under proportionality and are discussed in the next chapter.

environment and therefore necessarily affects other states. The question is not whether a state may harm a bystander to get at an aggressor. It is whether multiple victims of the same ongoing wrong may each take defensive action when no action is available that does not affect other victims. This is not the theory working as intended. It is a scenario the theory was not built to adjudicate, because the standard framework assumes that defensive action can be directed at the source of the threat without necessarily implicating other victims. When that assumption fails, as it does in the climate case, the theory's inability to guide action is not a feature but a structural limitation that requires theoretical development. Two features distinguish the climate scenario from the limit cases just war theory handles confidently, features that bear on whether the strict version of the objection (a defender who cannot act without harming innocents must absorb the loss) transfers cleanly here. First, the threat is ongoing and existential rather than pending: a state facing dissolution is not weighing whether to escalate against a threat that may yet be averted by other means, but whether to act against its own ongoing destruction. Second, the moral standing of a state is not reducible to that of an individual. A state has affirmative obligations to its citizens that an individual does not have to herself; it cannot, consistent with those obligations, simply accept its own annihilation the way an individual might absorb a loss in order to spare a bystander. Neither feature exempts states from proportionality, which Chapter 4 takes up in detail. Both bear on whether the climate case is the case the strict reading was built to govern.

Another potential response to conflicting claims of self-defense is that a more precise understanding of self-defense justifications might resolve the conflict. In Chapter 1, I surveyed several self-defense frameworks, including liability views, lesser-evil justifications, agent-relative prerogative views, and autonomy-based accounts, and argued that the climate case falls within the domain of self-defense across these frameworks. The question now is whether any of these accounts, applied more carefully, can adjudicate between conflicting defensive claims. Here, I focus specifically on the liability justifications, since lesser evil justifications reduce to proportionality considerations that will be explored in the next chapter. Within liability justifications for self-defense, there are three accounts to consider, the culpability account, the causal account, and the responsibility account.

The culpability account states that a person is liable for an unjust threat if and only if they are blameworthy. Under this account, if I am morally blameworthy then I am liable, and in this context

liable means open to defensive harm.¹⁸⁶ For example, a murderer is culpable because they are morally blameworthy for the act of murder and have therefore opened themselves to the possibility of defensive harm. This account disallows certain types of harm being blameworthy, such as accidental harms. The causal account states there is justification for defensive harm when there is a causal connection between the victim and the person committing the initial harm.¹⁸⁷ Here, the murderer is liable for defensive harm because there is a causal connection between their actions and the harm done to the victim. This account expands the potential for defensive harm, such that accidental threats can be defended against. Finally, the responsibility account states that a person is liable for defensive harm if they are morally responsible for the threat to the victim.¹⁸⁸ This account is more nuanced, and includes conceptions of distributive justice and fairness, such that a person may be liable for defensive harm if the risk of their activities makes them morally responsible.

When considered as a justification for use of SSI by a victim state, the three accounts provide varying degrees of support. The causal account provides the most straightforward justification, since it requires only a causal connection between the threatening party's conduct and the harm faced by the victim. High-emitting states have a clear causal connection to the harms of climate change, and even climate change itself, understood as a human-produced process, satisfies the causal criterion. The culpability account is less straightforward but still applicable. It requires blameworthiness, not merely causation. The objection would be that many emissions were produced before the harms were understood, and that states emitting today are doing so within economic systems they did not unilaterally design. However, the culpability account does not require that each individual act of emission be blameworthy. It requires that the party maintaining the threat-producing conduct be blameworthy. Since at least the early 1990s, when the scientific consensus on anthropogenic warming solidified, continued high-emission policies by industrialized states have been pursued under conditions of knowledge. The failure to undertake available mitigation measures despite awareness of the consequences constitutes the kind of culpable maintenance of a threat that grounds liability under this account. The responsibility account occupies a middle position. It requires not full-blown culpability but moral responsibility, understood to include considerations of fairness and the distribution of risk. Here, the argument is that states whose industrial activity has disproportionately

¹⁸⁶ Kimberly Ferzan, "Culpable Aggression: The Basis for Moral Liability to Defensive Killing," *Ohio State Journal of Criminal Law* 9, no. 2 (2012): 669-697.

¹⁸⁷ Judith Jarvis Thomson, "Self-Defense," *Philosophy & Public Affairs* 20, no. 4 (1991): 283-310.

¹⁸⁸ McMahan, "The Basis of Moral Liability," at 386-405.

produced the conditions threatening other states' survival bear moral responsibility for those conditions, even where individual blameworthiness is diffuse. The responsibility account asks who should bear the costs of a risk-imposing activity, and it answers: those who created and sustained the risk, not those who merely suffer its consequences.

Under all three accounts, then, there is a plausible basis for a victim state's defensive claim, though the strength of the justification varies. The causal account provides the clearest path, the responsibility account a strong secondary path, and the culpability account the most contested but still defensible path. What matters for the present argument is that even the weakest of the three does not foreclose the defensive claim. These accounts can also be quite robust, and though they may approach the problem from different places, provide answers for complex situations. For example, the causal account provides an answer to innocent threats or accidental threats.¹⁸⁹ Consider a thought experiment originally posed by Robert Nozick: a person is blown into the bottom of a well by no fault of their own. Later, another person is also blown into the well and will crush and kill the first person upon landing. The person at the bottom has a ray gun that can vaporize the falling person and save their own life, but doing so will kill the falling person.¹⁹⁰ Under the causal account, the person at the bottom has the right to use the ray gun even though the falling person is entirely innocent, because there is a causal connection between the threat and the falling person. Judith Jarvis Thomson provides the underlying reasoning for this conclusion. She argues that because the falling person lacks a right to kill the person at the bottom, the falling person is under a duty not to kill them. The falling person will fail in this duty, and thereby violate the other's right, if she does in fact kill them. Since the falling person is threatening to violate a right not to be killed, she herself lacks a right not to be killed. The person at the bottom may therefore act in self-defense, even though the falling person is morally innocent.¹⁹¹ With some imagination, we can see how this account might be applied to some scenario, but the issue at play is that it does not apply to our current issue, nor do the various arguments connected to the other accounts. We might change the above scenario such that it matches the type of scenario that we are attempting to solve with relation to state-level self-defense against the harms of climate change. Recall, that one issue with conflicting claims of self-

¹⁸⁹ This is meant as a reference for how the various accounts treat certain situations, not as an endorsement of the account or an argument that the account correctly identifies what form of self-defense is allowed in this situation.

¹⁹⁰ Robert Nozick, *Anarchy, State, and Utopia* (New York: Basic Books, 1974), at 34.

¹⁹¹ Thomson, "Self-Defense."

defense is that there are two (or more) victim states that each want to use some version of geoengineering, but their particular technique will either harm the other victim, or in a more likely scenario, will undermine the attempts made by the other state to defend themselves. With that in mind, we might modify the Nozick/Thomson examples as follows:

Victim and Equal Victim have fallen down connected wells, such that the wells share a water table. They are both in this predicament through no fault of their own. Victim and Equal Victim are both treading water and will eventually drown if nothing is done. Each well has a valve. The valve in the well occupied by Victim will slightly lower the water level in each well, such that Victim will be able to stand on the bottom. Equal Victim will still drown since their well is deeper. The valve in the well occupied by Equal Victim will flood both wells, raising the water level such that Equal Victim will be able to reach a small ledge and avoid drowning. However, this will raise the water level in Victim's well also, such that they will drown. If both valves are opened, then both Victim and Equal Victim will likely drown.

This scenario maps onto self-defense against climate change quite well. Both Victim and Equal Victim have mutually conflicting claims of self-defense as a way to save their own lives but will potentially undermine the others attempt. Both attempts at saving their lives are against an environmental threat (water) and are not directed at the other or the original cause. Finally, neither brought the threat on themselves. We can imagine that the above scenario involves Owner, who earned money off the wells, but failed to properly secure them such that both Victim and Equal Victim fell because of Owner's negligence. No account of self-defense we explored (culpability, responsibility, or causal) gives a clear indication of which of the two victims have the right to move forward with saving themselves. It appears that under the three accounts, either both are allowed to move forward, or else neither are, and this leaves the unsatisfactory answer that in both cases Victim and Equal Victim die, while Owner lives. The issue with conflicting claims of self-defense is that in our normal exploration of self-defense there is a potential aggressor, innocent bystanders, and a host of other considerations. However, none of the accounts explore conflicting claims of self-defense, and certainly not with the assumption that both potential claims are on solid moral footing. This is a problem, but even more so when we attempt to apply this to just war theory and use these claims as a foundation for just cause. The only possible solution that these accounts appear to offer is to reject the right to self-defense for both states, and this leaves us with the undesirable (and potentially indefensible) stance of telling two states, who both owe a form of defense to their respective citizenry, that they must simply allow themselves to be (somewhat metaphorically, but also not) washed away. Alternatively, since both states have the same moral foundation, each account might provide that

each state has the right to self-defense. In either case, the lack of being action guiding undermines the value to just war theory and does not provide us a path forward with regard to self-defense, just cause, and SSI.

5. Conclusion

In this chapter I engaged in a general exploration of just war theory, then I attempted to situate SSI within the just cause requirement of *jus ad bellum*. When we consider the foundational support for traditional just cause claims is self-defense, the issue of conflicting claims of self-defense comes into focus. There may be (and I argue most certainly are) multiple states with legitimate just cause claims that would allow them to pursue some form of geoengineering to stave off the harms of global climate change. The issue is that some of these states may choose (or need) to pursue forms of geoengineering that conflict with one another, or potentially undermine the other's efforts. Herein lies the problem. We need just war theory, much like any ethical framework, to be action guiding. When we have multiple states, all desiring to act under claims of self-defense, then just war theory fails to provide a path forward. We end up with two undesirable conclusions, either neither are allowed to act, or both are allowed to act with the contradictory result being they are both justified in acting (and therefore not liable to harm for their actions) but will be undermining (harming) the other.

There does not appear to be a viable solution to the first undesirable solution, that neither are allowed to act. I have rejected this as unsatisfactory given the protection each state owes its own citizenry. However, it is possible there is a solution within just war theory for the second issue. It could be the case that both states satisfy their just cause constraints within just war theory, but violate a second constraint that offers a path forward. As I have referenced several times, this second constraint would be proportionality. It may then be the case that we can ignore the conflicting claims of self-defense, because one state cannot move forward due to proportionality requirements. In the next chapter I will explore proportionality more fully, both as a *jus ad bellum* and a *jus in bello* requirement and apply this exploration to the issue of SSI as a defense against climate change harms.

Chapter 4: Proportionality

1. Introduction

One of the powerful aspects of just war theory as it is currently understood, from either a traditional or revisionist perspective, is that each component is necessary. By this I mean that every part of just war theory must be satisfied and each criterion must be met, before a move to war can be considered just. There may be some intuition that as long as the just cause requirement is satisfied, then the move to war is just; however, each of the other components (proportionality, necessity, etc.) must also be satisfied and no component of just war theory is, in itself, sufficient to justify going to war. A move as violent, disruptive, and extreme as war must satisfy every condition.

So far in this project, I have argued that the harmful effects of climate change constitute a harm sufficiently severe that they can be considered an act of war. I have further argued that this creates a significant challenge for just war theory because multiple states might have just cause to respond to this harm, yet could do so in conflicting (and mutually harmful) ways. This presents a substantial problem, as just war theory does not clearly indicate how to resolve situations involving conflicting claims of self-defense. One possible response is that just war theory is not obligated to provide an affirmative resolution for every scenario involving conflicting self-defense claims. Indeed, multiple states involved in a conflict may each satisfy various components of just war theory. However, given the strength and stringency of just war requirements, the powerful prohibition against armed conflict, every criterion must be met. Therefore, proportionality provides a promising framework for resolving the difficulties outlined earlier in the project. Even if a state has just cause, that justification is irrelevant if the state cannot also satisfy proportionality constraints, thereby offering a way to adjudicate between conflicting claims.

This chapter will explore proportionality as it relates to just war theory and geoengineering. I will first explore how proportionality concerns, or proportionality-adjacent concerns, are at the heart of many existing arguments against geoengineering. I will then move on to explore how proportionality is understood by both traditionalists and non-traditionalists. Traditionalists such as Michael Walzer already reject strong versions of proportionality, which leaves just war theory still stuck with regard to geoengineering as a defense to the harms of climate change. However, revisionists such as Jeff McMahon reject the limits of proportionality that are envisioned by Walzer

and instead endorse a much stronger understanding of the limits imposed by proportionality, with regard to both *jus ad bellum* and *jus in bello*. I argue that McMahon fails to grasp the weight of obligation placed on the state, and that his understanding of proportionality is based on flawed individualistic reasoning. This leads to my conclusion—that some states can satisfy every requirement of just war theory, and that something else is needed to provide an acceptable answer to conflicting claims of self-defense.

2. Proportionality Objections to Geoengineering

Before examining how proportionality constrains the use of SSI as a defensive measure, it is important to clarify what proportionality means within just war theory, because the concept functions differently here than in utilitarian reasoning. A utilitarian cost-benefit analysis asks whether the total good produced by an action outweighs the total harm. Proportionality in just war theory asks a different question: whether the defensive response is commensurate with the severity of the threat being defended against. The distinction matters. Under a utilitarian framework, an action that produces net positive outcomes is justified regardless of the relationship between the threat and the response. Under JWT proportionality, the response must bear an appropriate relationship to the wrong being resisted. A state cannot kill thousands in self-defense to prevent the theft of a few acres of farmland, even if doing so would somehow produce net positive consequences, because the response is not commensurate with the threat. This is the sense of proportionality that governs the analysis in this chapter. Within JWT, proportionality operates at two levels. At the level of *jus ad bellum*, proportionality requires that the overall anticipated goods of going to war, including the goods of resisting injustice, are not outweighed by the anticipated harms. At the level of *jus in bello*, proportionality requires that the harms produced by specific military actions are not excessive relative to the military advantage gained. Jeff McMahan has helpfully distinguished these further into narrow proportionality, which concerns harms imposed on liable parties, and wide proportionality, which concerns harms imposed on non-liable parties such as civilians. These distinctions will be important throughout the analysis that follows, because SSI uniquely engages both forms: it imposes harms on those arguably responsible for climate change (narrow) and on entirely uninvolved populations (wide), and the inability to separate these effects is central to the problem.

Although the geoengineering literature does not always employ the language of just war proportionality, the underlying concern is pervasive. When Dale Jamieson discusses “social and

economic preferability” in his early work on geoengineering, he is engaging in precisely this kind of reasoning: the question of whether the harms of geoengineering are preferable to the harms of unchecked climate change is a question about the proportionality of the response to the threat.¹⁹² Similarly, when Stephen Gardiner discusses what he calls “Arming the Future,” he frames the issue in terms that are functionally equivalent to proportionality.¹⁹³ He describes a scenario in which, if mitigation efforts continue to fail, we may eventually face a choice between allowing catastrophic climate impacts or engaging in geoengineering. Both options are conceded to be bad, but geoengineering is argued to be the less harmful course. Gardiner's framing here is not utilitarian in the straightforward sense. It is about whether the harms of the proposed response are commensurate with the severity of the threat being addressed, which is the structure of a proportionality judgment even when the term is not invoked. The same structure appears in arguments that frame geoengineering as a “lesser evil,” a formulation that recurs throughout the literature. When authors weigh the potential harms of SSI deployment against the harms of inaction, they are performing a proportionality assessment, whether or not they describe it as such. Risk-management arguments, which focus on mitigating the potential dangers of geoengineering, and arguments about unintended consequences both reflect the same underlying proportionality logic.

Recognizing that proportionality is already doing significant work in the geoengineering literature, even under other names, matters for this project because it shows that the move from climate policy debates to just war proportionality is not a conceptual leap. The evaluative structure is already in place. What the just war framework adds is precision: it distinguishes between the proportionality of the overall decision to act (*ad bellum*) and the proportionality of specific actions within that response (*in bello*), and it distinguishes between harms to liable and non-liaible parties. These distinctions, as I will argue, are exactly what is needed to evaluate the permissibility of SSI, and they are exactly where the framework encounters its most serious difficulties.

¹⁹² Dale Jamieson, “Ethics and Intentional Climate Change,” *Climatic Change* 33, no. 3 (1996): 323–336, <https://doi.org/10.1007/BF00142580>.

¹⁹³ Stephen M. Gardiner, “Is ‘Arming the Future’ with Geoengineering Really the Lesser Evil? Some Doubts about the Ethics of Intentionally Manipulating the Climate System,” in *Climate Ethics: Essential Readings*, ed. Stephen Gardiner, Simon Caney, Dale Jamieson, and Henry Shue (Oxford: Oxford University Press, 2010), 284–314.

3. Proportionality and War (Traditionalist)

Considering proportionality with regard to *jus ad bellum*, the anticipated benefits of going to war must be carefully weighed against the likely harms. However, this involves more than merely assessing kinetic or physical damage; it also requires accounting for both the physical and moral harms that might result from going to, or abstaining from, war. Suppose Canada decides to annex a thin strip of North Dakota. They cross the border with military vehicles and shift the boundary several hundred yards south. This would constitute an armed invasion and, on its face, appears to satisfy most *jus ad bellum* criteria for the United States to respond militarily. However, proportionality requires that we consider the potential physical damage and destruction, the cost of the war machines, the cost in lives, and the moral cost of potential *jus in bello* violations that are bound to occur in any significant conflict.¹⁹⁴ These must be balanced against the harm incurred by avoiding war. While losing a few hundred yards of North Dakota might seem trivial, proportionality also prompts us to consider the moral injustice involved, as well as concerns about the slippery slope of permitting future land seizures by those “crazy Canucks.”

On the other hand, when we consider the *jus in bello* requirements, we weigh the damages caused by a particular action or set of actions in war against the benefits of those actions. Put another way, we have to consider whether the harms from a specific mission, say bombing a bridge, are outweighed by the importance of destroying the bridge to the war effort. In this scenario, harms include both military and non-military in nature. For example, if destroying the bridge would harm civilians (e.g. demolishing a nearby settlement) and disrupt civilian and military travel, then those harms must be weighed against the military advantage. Seth Lazar describes this form of proportionality as “foreseen but unintended harms must be proportionate to the military advantage achieved.”¹⁹⁵

When considering SSI deployment as an act of defensive war, one worry is that such claims run counter to both uses of proportionality. Stephen Gardiner presents just such a worry regarding the use of self-defense claims to defend the use of SSI.¹⁹⁶ He points out that self-defense is a limited

¹⁹⁴ Lazar, “War.”

¹⁹⁵ *Id.*

¹⁹⁶ Stephen Gardiner, “The Desperation Argument,” at 29.

concept within just war theory. For instance, after just cause is established, a country might be justified in using air strikes to remove a threat but not necessarily justified in launching a full-scale invasion of the threatening nation. SSI, due to its global climatic impacts, appears more akin to a large-scale invasion than targeted air strikes. Furthermore, SSI's lingering and indiscriminate nature makes it comparable to a nuclear strike. Thus, proportionality, at least as traditionally understood, likely cannot justify such actions, even when a combatant clearly has just cause. This restriction due to proportionality places those low-lying countries that were referenced by Fruh and Hedahl in an odd situation.¹⁹⁷ That is, they are being destroyed by climate change, but proportionality effectively forbids them from doing the only thing in their control that could save their country.¹⁹⁸

This is a function of proportionality that is explored by Michael Walzer in his paper "Responsibility and Proportionality in State and Nonstate Wars."¹⁹⁹ Suppose a militant group repeatedly launches attacks from civilian apartment buildings within its territory into a neighboring state. Efforts by that state to neutralize these threats inevitably involve striking the civilian buildings sheltering the attackers, resulting in significant civilian casualties. Generally, *jus in bello* proportionality demands that the military value of an objective significantly outweigh any civilian harm. For instance, a factory should not be bombed if the anticipated civilian casualties are excessive compared to the factory's military importance. However, in Walzer's example, the rocket launchers are amongst civilian apartments and homes, such that potentially dozens of civilians would be killed to take out a single rocket launcher. It seems to be a case where proportionality will always be violated.²⁰⁰ Walzer argues that in such situations, it must be possible for those being aggressed against to defend themselves. He states, "it is a central principle of just war theory that the self-defense of a people or a country cannot be made morally impossible, and so the more successful [the militants] are in hiding among civilians, the less useful the proportionality argument is—or to be more precise, the less limiting it is."²⁰¹ Here he is arguing that when one side of an engagement sets up the board

¹⁹⁷ Fruh and Hedahl, "Climate Change Is Unjust War," at 378-401.

¹⁹⁸ This is said with the caveat that SSI use being the "one thing" is certainly not settled. Stephen Gardiner addresses this sort of claim in "The Desperation Argument."

¹⁹⁹ Michael Walzer, "Responsibility and Proportionality in State and Nonstate Wars," *Parameters* 39, no. 1 (2009): 40-52.

²⁰⁰ The original example above used by Walzer references Israel, Hamas, and Hezbollah. I changed the wording slightly to remove references that are controversial. It should be noted that I am making no statement or argument regarding the current conflict in Gaza, or any past conflicts in the region, nor am I endorsing or criticizing any particular view.

²⁰¹ Walzer, "Responsibility and Proportionality," at 48.

in such a way that no amount of care can be taken without violating proportionality, then proportionality loses its power to prohibit action by those aggressed against. For Walzer, this triggers a consideration of responsibility. That is, civilians that should not have been killed were killed, but the responsibility for their death is placed on those that undermined the proportionality constraint. So, in his example he is placing responsibility with the members of militant group for the violation of proportionality by the defense forces that resulted in disproportionate civilian deaths.²⁰² Put in other terms, imagine that some state is routinely attacked by rockets launched from cruise ships that sail off its coast. The state tries to change the course of the ships or to change the security measures in place for screening passengers—through negotiation with the ship point of origin and the company that runs the cruises—but to no avail. Adversaries of the state keep sneaking onto cruise ships and launching rockets at the coastline. No single rocket attack kills a large number of civilians of our fictitious oceanfront state, with rocket attacks often killing no one. Even the most “successful” rocket attack kills fewer than a dozen people. The state being attacked has limited military capabilities, but what they do have is the ability to sink the cruise ships. The problem is that such an action would bring about the deaths of thousands of cruise-goers who have nothing to do with the rocket attacks. When we consider the deaths of thousands against the backdrop of very little harm being done in some cases, or only a few deaths in the worst cases, it seems that proportionality will not allow such a response. This is the situation to which Walzer is objecting. You simply cannot create a situation in which every response in justified defense is morally wrong, and then criticize whatever action is taken. You must allow a state to defend themselves and you cannot create a situation that prohibits them from defending themselves. If so, then you are morally responsible for the excess harms and the violation of proportionality, not the state defending itself.

Walzer’s reasoning here deserves closer scrutiny, because the claim that self-defense cannot be made morally impossible is not self-evident. One might respond that morality is sometimes demanding: that there are cases in which the only available defensive options impose such severe harms on innocents that the morally correct answer is that the defender must absorb the loss. This is a serious objection, and I do not think it can be dismissed entirely. There are certainly cases in which JWT rightly prohibits defensive action because no proportionate response is available. However, Walzer’s argument is not simply that self-defense must always be permitted. His argument,

²⁰² *Id.*

more precisely, is about the allocation of moral responsibility when one party deliberately structures the situation so that the other party cannot defend itself without violating proportionality. In the militant-among-civilians case, it is the militant group's choice to embed among civilians that creates the proportionality trap. Walzer's claim is that this choice transfers responsibility for the resulting civilian deaths from the defender to the party that created the impossible situation. The defender still has obligations of care, still must minimize harm, and still operates under proportionality constraints. But those constraints are relaxed in proportion to the degree to which the opposing party has deliberately undermined them. The question for the climate case is whether this transfer-of-responsibility logic applies. I argue that it does, though with an important qualification. High-emitting states have not deliberately embedded themselves among civilians in the way a militant group does. However, they have, through decades of emissions under conditions of knowledge, created a situation in which the only available defensive response (SSI) necessarily imposes global harms. The structural effect is analogous: the defender's proportionality constraint has been undermined not by a deliberate tactical choice but by the cumulative conduct of the parties whose emissions produced the threat. The moral logic of responsibility transfer applies in both cases, though the degree of culpability differs. This is why I argued earlier that the framework should track culpable endangerment rather than hostile intent: what matters is not that high-emitting states intended to trap vulnerable states, but that their conduct foreseeably produced a situation in which no proportionate defense is available.

If we apply this same line of reasoning to the use of SSI for self-defense, we arrive at a similar form of justification. In Walzer's terms, high-emitting countries have created conditions under which it becomes morally impossible for vulnerable states to adequately defend themselves without violating proportionality. Put differently, the actions of high-emitting states have limited the available defensive responses of countries like Kiribati or Tuvalu, such that the only viable recourse, SSI, would otherwise appear disproportionate. However, the harms from that disproportionate use would be the responsibility of those high-emitting countries who have failed to take adequate action (such as the U.S. and China). Of course, other just war requirements would still apply, and making proportionality less restrictive does not eliminate its role entirely. For example, suppose a group of

low-lying countries decided to engage in SSI over the objection of major post-industrial powers.²⁰³ If they then used the self-defense argument to justify the use of SRM, they could not simply use it to maximum benefit, with the consequences be damned and blame the unpleasant results on the U.S. and China. It would have to be the case that even then, they would be required to choose a form and manner of deploying SRM that did the least amount of global harm, balanced against the good to come for their own citizens.

It must be acknowledged that framing SSI in Walzerian terms strains against Walzer's own strong commitment to noncombatant immunity. Walzer famously holds that civilians are "men and women with rights" who "cannot be used for some military purpose, even if it is a legitimate purpose."²⁰⁴ He only permits incidental harm to noncombatants under the strict condition that it be minimized and truly unavoidable. The prospect of a defensive SSI deployment, however, entails knowingly imposing climatic harms on civilian populations worldwide—effectively making innocents bear the cost of a nation's defensive strategy. Walzer did countenance a supreme emergency exception in wartime, wherein even the usual ban on targeting innocents could be overridden to prevent a community's annihilation.²⁰⁵ But casting climate change as a "supreme emergency" is problematic. The climate threat, while grave, is diffuse and long-term, lacking the clear and immediate menace of Walzer's paradigm cases (for instance, the imminent destruction of a political community by a genocidal aggressor). Unlike a wartime supreme emergency—a narrowly bounded crisis that might justify violating civilian immunity as the lesser evil—the SSI scenario involves ongoing, distributed risks without a singular culpable opponent. Thus, even if low-lying states plead existential necessity, the supreme emergency framing sits uneasily here. Still, this concern, while significant, does not disqualify the use of SSI under Walzerian principles—it merely narrows its permissible scope. SSI use would be disqualified for nearly every state, because the threshold for supreme emergency remains appropriately high. However, it can plausibly be met by small island nations or similarly vulnerable states facing the total loss of sovereignty or territorial existence. In such cases, SSI is not a tool for managing inconvenience or avoiding moderate harm; it becomes a

²⁰³ If this were to occur, the world powers (the ones with all the big military budgets) would undoubtedly shut the whole thing down. Stephen Gardiner points this out in "The Desperation Argument." The point here is that if/when the major powers did shut SSI down, either through economic blockade or by force, then they would (according to what we have developed here) be the unjust side of the engagement. In other words, they would be the aggressor.

²⁰⁴ Walzer, *Just and Unjust Wars*, at 165.

²⁰⁵ *Id.* at 251-268.

last-resort defense against annihilation. When the continued existence of a political community is genuinely at stake, Walzer's framework allows for otherwise impermissible actions, including harms that might violate civilian immunity. The justification does not rest on the typical cost-benefit calculus but on the preservation of a people whose self-defense options have been structurally foreclosed. Thus, while Walzer's model sets a high bar, it still provides a viable moral path for the most imperiled states.

These caveats in mind, it appears that proportionality would not prevent the use of SSI in the correct situation. However, to this point we have considered proportionality as it is understood by Walzer and other traditionalists. Many revisionists, particularly Jeff McMahan, take a much stronger stand regarding proportionality, and reject that there are limits to the absolute power of the principle.

4. Proportionality and War (Revisionist)

Walzer's approach to proportionality is notably more permissive under extreme circumstances than McMahan's stringent revisionist stance. While Walzer embraces a kind of moral flexibility—when he insists that the self-defense of a political community “cannot be made morally impossible,”—McMahan treats proportionality as an inviolable moral limit grounded in individual rights, rejecting Walzer's sliding-scale exceptions. For McMahan, even a just cause cannot override certain harms to innocents: if saving oneself would unavoidably kill five bystanders, “morality requires the victim to submit to being wrongly killed” rather than transgress that boundary.²⁰⁶ He even argues there must be a cap on killing enemy combatants for a just cause, a notion Walzer does not similarly emphasize. This stark divergence shows how Walzer's traditionalist view finds room for tragic exceptions in war, whereas McMahan's revisionism permits far less leeway, treating proportionality as a strict side-constraint that no degree of necessity can fully override.

McMahan divides proportionality into two distinct categories: narrow proportionality and wide proportionality. The distinction tracks the moral status of the parties being harmed, not the strictness of the constraint. Narrow proportionality concerns harms imposed on those who are liable to be harmed—parties whose conduct has made them legitimate targets of defensive force. Wide proportionality concerns harms imposed on those who are not liable—innocent bystanders, civilians

²⁰⁶ McMahan, *The Ethics of Killing*, at 406–408

not party to the conflict, and others whose moral standing is unchanged by the threat at issue. The terminology can mislead. “Narrow” here does not mean “more restrictive,” and “wide” does not mean “broader scope of allowed force.” “Narrow” refers to the narrower class of parties to whom the constraint applies (just the liable), while “wide” refers to the wider class of all those who might be affected (including the non-liable). The relationship between the two, somewhat counterintuitively, runs the other way: wide proportionality is by far the more restrictive of the two, because the parties it protects are not liable to defensive harm in the first place.

Narrow proportionality applies to those who are liable to be harmed or killed.²⁰⁷ An aggressor breaking into your home with the intent of causing you or your family harm is liable to be harmed. Provided the force used to dissuade or stop the attacker is reasonable in relation to the potential or expected harm, harm used against the attacker is allowed under this proportionality constraint. Unlike the parallel case involving bystanders, multiple liable parties can all be harmed without violating narrow proportionality. If there were five culpable attackers who will seriously harm or kill your family unless they are stopped, narrow proportionality allows that they may all be killed to prevent the harm—even if the harm being prevented is only the potential death of one family member, or perhaps just serious injury rather than death.

Wide proportionality, by contrast, is far more restrictive. It limits harms imposed on parties who are not liable—innocent bystanders, civilians, and others who bear no responsibility for the threat. The limiting force of wide proportionality is intended to be powerful, even when the agent imposing harm is herself the victim of unjust aggression. McMahan states, “Suppose, for example, that the only means by which a person can prevent herself from being killed by a culpable attacker would unavoidably kill five innocent bystanders as a side effect. Assuming that it would be disproportionate to kill five innocent people to save one, morality requires the victim to submit to being wrongly killed.”²⁰⁸ The reasoning is that while the victim is innocent, so are the bystanders that would need to be killed to save the victim. Since the bystanders are not liable—not connected to the culpable attacker in any morally meaningful way—they hold the same moral standing as the victim. Wide proportionality may allow the victim to kill one innocent bystander in self-defense (this is not

²⁰⁷ Jeff McMahan, “The Ethics of Killing in War,” *Ethics* 114, no. 4 (2004): 693–733, at 700–704.

²⁰⁸ Jeff McMahan, “Liability, Proportionality, and the Number of Aggressors,” in *The Ethics of War: Essays*, ed. Saba Bazargan and Samuel C. Rickless (New York: Oxford Academic, 2017), 3–27, at 3.
<https://doi.org/10.1093/acprof:oso/9780199376148.003.0001>.

guaranteed, and some argue against it), but anything more is a violation.²⁰⁹ The result of this understanding of proportionality is that wide proportionality is incredibly constraining, while narrow proportionality is much less so. It might lead some to accept that there is no limit to the number of people who might be killed or harmed if they are morally liable to that harm. McMahan states, “Those who resist the idea that an act of war could be impermissible because the number of enemy combatants it would kill would be disproportionate might try to defend their view by arguing that narrow proportionality, which is what is at issue in the killing of enemy combatants, is insensitive to the number of combatants that might be killed.”²¹⁰ Stated differently, when discussing narrow proportionality, there appears to be no upper limit on harming culpable agents, assuming other just war criteria (such as necessity) are met.

For many, it is counter-intuitive that there is no level of constraint. If that were the case, one might question the very relevance of narrow proportionality. Indeed, wide proportionality alone would matter, and narrow proportionality would effectively lose its meaning. We can consider examples that might align with those intuitions. If there was some small group of innocent victims that are at risk, could we kill a million times the number of enemy combatants to save those small number of victims outside the overall war effort? Are ten innocent lives worth the cost of 10 million enemy combatant lives, if those enemy combatant lives are considered outside the overall goal of winning the war? McMahan suggests that this might not be the case. He states, “I think this must be mistaken. There must, at least in many cases, be a limit to the number of unjust combatants it can be permissible to kill in a war fought for the sake of a just cause.”²¹¹ In order to explain and defend this statement, McMahan wants to consider something other than innocent defenders and morally culpable aggressors. It is important to understand why McMahan believes that the victim is allowed to use lethal force in the case of morally culpable aggressors, such as someone trying to kill the victim. This self-defense justification is not based on the aggressor dying being a lesser evil than the victim dying, or the aggressor giving some sort of permission to be killed through his actions. Instead, it is, in McMahan’s words, “[T]hat, by being the unjustified aggressor, he has made himself morally liable to be killed.”²¹² This might lead us to believe that any number of culpable aggressors can be killed to protect the life of the innocent victim, since they have all made themselves liable to be killed. We

²⁰⁹ *Id.*

²¹⁰ McMahan, “Liability,” at 4.

²¹¹ *Id.*

²¹² *Id.* at 3.

can imagine a scenario where there is a victim that is about to be killed by an unjust aggressor, and will be killed, unless they kill the aggressor instead. Now imagine that there are 1000 unjust aggressors that will all appear, one after the other, and attempt to kill the innocent victim. The only way for our innocent victim to save their life is to kill them, one after the other as they appear. Given that they are all liable to be killed, and given our previous intuitions, it seems natural that we would say that the innocent victim is justified in killing all 1000 unjust aggressors and that no violation of proportionality has occurred.²¹³ However, McMahan wants to push back against this intuition.

The first step is to consider cases where instead of a cut and dried aggressor that is clearly in the wrong of their own volition, we consider someone who is, as McMahan says, “minimally responsible.”²¹⁴ A minimally responsible killer would be someone who, while being the cause of another’s death, does not bear the full weight of the liability, or else the liability is mitigated in some manner. Minimally responsible killers may end up being killers, or potential killers, due to bad luck. For example, they could honestly believe they are heroically preventing a death by killing an innocent victim, because they mistook (again honestly) the victim for an aggressor. An example where the aggressor is even more minimally responsible is when a person driving a car that is well maintained and driven in a safe manner, kills a pedestrian due to mechanical failure. Every time we decide to drive a vehicle, we know we are putting the lives of other people at risk. The pedestrian is still an innocent victim, and the driver is still the aggressor, but the responsibility is minimized to such a degree that it might change our calculus when figuring what might be proportionate.

In the case of the driver and pedestrian, we might consider the difference, from a moral perspective, between the death of the pedestrian and the death of the driver of the car (assuming the pedestrian had a lethal defense against being hit and killed). The moral difference between the two deaths is now much less than in the case of the culpable attacker and the innocent victim. McMahan argues that, “[T]he moral difference between each killer and the victim is so slight that it seems there must be a limit to the number of minimally responsible killers it can be permissible to kill. Indeed, the difference is so slight that, if there were only a single minimally responsible killer, it could be disproportionate to kill him if the loss he would suffer in being killed would be substantially greater than the loss the victim would be prevented from suffering—for example, if the killer were 18 while

²¹³ *Id.* at 21.

²¹⁴ *Id.*

the victim were over a hundred and would die soon in any case.”²¹⁵ In other words, when the moral standing between the aggressor and victim is so similar, then proportionality shows up much sooner. So, while our previous intuitions might be that an innocent victim was allowed to kill 1000 attackers that showed up one after the other, and this is not a violation of proportionality, it is certainly not the case that our intuition is such that an innocent pedestrian is allowed to kill 1000 motorists that are minimally responsible for the pedestrian’s potential death. While this may only be a product of the moral difference between the victim and aggressor, McMahan believes it tells us something else.

This move from innocent defender versus morally culpable aggressor to innocent defender versus minimally responsible aggressor shows that if there is some number of minimally responsible agents that would be too many, then there is some number—many times greater—of morally culpable agents that would be too many. In other words, while the idea of 1000 morally culpable aggressors versus a single innocent victim might not trigger our intuition that proportionality has been violated, our intuitions in the case of the minimally responsible aggressor gives us some evidence that there is a limit. The limit might be outrageously large. For example, a single victim cannot choose to kill the entire population of Earth as an act of self-defense, even if all 8 billion of us are morally culpable aggressors of the worst sort, but the limit is likely much less. Can a victim kill a million culpable aggressors? Ten million? At some point, if our reasoning to this point is correct, we will reach a number of culpable aggressors that is too large to justify due to proportionality.²¹⁶

David Rodin, who McMahan responds to at length while developing the preceding argument, has a similar conclusion regarding the number of culpable aggressors that might be killed. With regard to a lesser-evil justification, he states that it, “by contrast, aggregates the defensive harms inflicted on all affected persons. It discounts the evil attributed to harm inflicted on the liable, but unless the harm is discounted to zero, it is still possible that defensive harm inflicted on multiple liable persons will not be the lesser evil.”²¹⁷ In other words, even when we are defending ourselves against a culpable attacker, we are still committing some harm. This harm might be justified or excused such that the overall value (weight) of the harm is lessened, but the harm is there regardless.

²¹⁵ McMahan, “The Ethics of Killing in War,” at 706.

²¹⁶ It should be noted that McMahan is not necessarily fully endorsing that there is a number of culpable combatants that can be killed, and he spends time looking for a way to explain away the argument to this point. However, his final thought is that there is no solution up to this point to suggest that these arguments are wrong.

²¹⁷ Rodin, “Justifying Harm,” at 99.

As such, when we are calculating proportionality, with our utilitarian-like calculus, we will eventually reach a number, no matter how much we discount the harm we are causing, where the defensive harm is disproportionate. That is, unless we simply discount the harm we are causing to zero, which he finds unsatisfactory.

This is obviously a very strong stance on proportionality, and one that McMahan is uncomfortable endorsing, even if he cannot work his way out of the problem. However, even if we set aside this extreme interpretation of proportionality regarding culpable aggressors, and instead adopt a more moderate stance—one endorsed by other revisionists—we encounter a related yet distinct proportionality issue: the permissibility of imposing harm on innocent parties through collateral damage. For example, Thomas Hurka argues, “If a person is attacked by a group of aggressors and can save his life only by killing them all, he is permitted to do so no matter how large the group.”²¹⁸ This stance contrasts sharply with McMahan’s and Rodin’s view on culpable aggressors. Nevertheless, even Hurka recognizes strong proportionality constraints regarding collateral harm to innocents or non-aggressors (wide proportionality), which significantly affects the permissibility of SSI use for self-defense. On *ad bellum* proportionality, Hurka writes, “the destructiveness of war must not be out of proportion to the relevant good the war will do. Even if there is a just cause and no way of achieving it other than war.”²¹⁹ Meanwhile, when considering *in bello* considerations he says, “And the *in bello* proportionality condition says the collateral killing of civilians is forbidden if the resulting civilian deaths are out of proportion to the relevant good one’s act will do; excessive force is wrong.”²²⁰ Both of these articulations of proportionality are a problem for SSI use as a means of self-defense.

When we consider both wide and narrow proportionality with regard to SSI, it becomes obvious that applying the stringent form of proportionality (as described by McMahan and Rodin) would disallow any use of SSI. The nature of SSI is such that it would affect the entire world. There is simply not a way to modify a small part of the climate without affecting everything. While the self-defense might save Kiribati, or the Maldives, it would also affect every other country on Earth. This would certainly be a problem in reference to low emitting states, as the requirements for both wide and narrow proportionality would fail, but it would likely be a problem for even those states that are

²¹⁸ Hurka, “Proportionality in the Morality of War,” at 53.

²¹⁹ *Id.* at 35.

²²⁰ *Id.* at 36.

the worst emitters. The problem is the harm from SSI is indiscriminate to an ultimate degree and even in the worst emitting states there are many climate innocents that have nothing to do with the state of the world with regard to climate change and the associated harms. This is true for many people in the United States, Australia, or any other state with high emissions.

Climate change and a potential SSI response uniquely engage both narrow and wide proportionality, but in ways that undermine those categories. On one hand, we can analogize narrow proportionality to the “liability” of high-emitting countries: in causing severe climate harms, these actors resemble unjust aggressors whom vulnerable nations might hold accountable. On the other hand, any SSI deployment would unavoidably implicate wide proportionality, because its effects “would affect the entire world”, not just the wrongdoing parties. There is no way to confine a climatic intervention to only the liable group; the fallout (e.g. disrupted weather patterns or other side-effects) will hit many who bear no responsibility for the problem. This collapses the usual distinction between combatants and noncombatants: in the climate context, almost everyone is intermingled as both contributor and victim to some degree, across generations. The result is that wide proportionality and narrow proportionality start to break down—proportionality itself becomes hard to calculate when harms and benefits are so diffusely distributed. From a state-obligation perspective, this breakdown is especially pronounced. States have moral obligations to protect their own citizens first and foremost (a duty stretching back through political theory from Augustine to Hobbes and Locke), and this includes safeguarding their people against future threats. We expect a state to prioritize the well-being of its population and future generations, much as a parent prioritizes a child. Yet in fulfilling that obligation via SSI, a state could inflict serious harm on other states’ citizens or on future people elsewhere—precisely what wide proportionality forbids. Climate change thus blurs the neat lines: narrow proportionality might justify a defensive response on behalf of the state’s populace, while wide proportionality simultaneously condemns that very act for imperiling innocent others. This tension reveals how collective and intergenerational harms defy the classical proportionality calculus. When the aggressors and the innocents are essentially global populations spread over time, the framework of just war proportionality struggles to provide clear guidance, pushing us to reconsider how states can ethically shoulder their protective duties in the face of global threats.

A more problematic issue for the use of SSI is that even if we step back and accept a weaker form of proportionality, it is still likely prohibited. Hurka’s statement about the collateral killing of

civilians is enshrined in the Geneva Conventions.²²¹ What is more, while the United States never ratified the particular protocol that contains the language used by Hurka, similar language is contained in the U.S. Army Field Manual. It states in part, “loss of life and damage to property incidental to attacks must not be excessive in relation to the concrete and direct military advantage to be gained.”²²² There are certainly a lot of moving parts here. We might simply accept that no amount of damage is “excessive” if we are talking about the destruction and loss of an entire nation, which is the case for several low-lying island nations. But generally, and with historical precedence, this language once again would prevent the use of SSI. This is particularly true when we consider the widespread potential for harm. When asked if the loss of millions of lives is proportionate to save fewer than 150,000 lives, then the answer might simply be that it is too excessive. Paul Ramsey puts it bluntly, saying, “One does not calculate a prudent number of babies to be murdered (directly killed) for the sake of any good consequences... attacks on a civil population can never be justified.”²²³ The conclusion is that for revisionists and international law alike, mass atrocities or large-scale targeting of civilians are never a legitimate solution to global problems—even dire ones like climate threats to small nations.

At this point, without Walzer’s rejection of proportionality in cases where no other defense is possible, it looks like revisionist views of just war theory could reject the idea of using SSI. This would solve the potential problem of conflicting claims of self-defense by making it irrelevant after the fact. However, I argue that the stronger proportionality claims are based on flawed methodology, and SSI as a defense against the harms of climate change remains a problem for just war theory.

5. A Rejection of Individualistic Analogies

Before developing this critique, let me preview where it is going. This section argues that revisionist proportionality fails because it rests on a methodological mistake: drawing conclusions about state-level proportionality from intuitions about individual-level self-defense. I begin by showing how prevalent this methodology is in the revisionist literature, then offer the central objection to it, that states bear obligations to their citizens that individuals do not bear to themselves.

²²¹ “1977 Geneva Protocol I Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts,” art. 51(5)(b), in *Documents on the Laws of War*, 3rd ed., ed. Adam Roberts and Richard Guelff (Oxford: Oxford University Press, 2000), 449.

²²² United States Department of the Army, *The Law of Land Warfare*, Field Manual 27-10 (1956), par. 41.

²²³ Paul Ramsey, *The Just War: Force and Political Responsibility* (New York: Scribner, 1968).

I develop the objection through three analogies (sacrificing oneself in traffic, corporations and shareholders, parents and children) and then turn to historical support from political philosophy, tracing the asymmetry from Augustine through Hobbes and Locke to twentieth-century realism. The conclusion of the section is that once the individual analogies are set aside, the door reopens to a more permissive understanding of state-level proportionality, one closer to Walzer's than to McMahan's.

One reason to trust that Walzer had the correct view of proportionality, while McMahan and others have the wrong view, is the way that many (most?) revisionists connect state level action to individual level conceptions of self-defense. Thomas Hurka acknowledges the use of individual conceptions of self-defense as follows:

As many writers have noted, the structure of just war theory closely parallels that of the morality of self-defense. The latter too allows the use of force only for certain ends, namely to protect one's own or another's rights, and limits that force by proportionality and necessity conditions. An act of self-defense is wrong if the harm it causes the attacker is out of proportion to the harm he threatens, or if the threat could just as well have been averted by less violent means. These parallels suggest a promising line of argument. Since our intuitions about self-defense are often clearer than our intuitions about war, we can try to make progress with just war proportionality by considering parallel cases involving individuals: if we think certain uses of force are not permitted by individuals, we can reach parallel conclusions about force in war.²²⁴

This connection, or as Hurka puts it "parallel", is certainly tempting, and it is true that our intuitions with self-defense cases on an individual level are easier to navigate. This ease of navigation has made the use of such individualistic thought experiments nearly synonymous with self-defense discussions within just war theory. In her book "Defensive Killing", Helen Frowe uses twenty-three such thought experiments in the first chapter, which is twenty-four pages long.²²⁵ McMahan and others make similar use of thought experiments tied to individualistic self-defense, though perhaps not as extensively.

Of course, some critics argue that the reliance on analogies itself is problematic. They contend that analogies oversimplify complicated moral and political issues or misrepresent critical differences between individuals and states. While these concerns should not be dismissed lightly,

²²⁴ Hurka, "Proportionality in the Morality of War," at 38.

²²⁵ Frowe, *Defensive Killing*, at 21-45.

analogies nevertheless play a valuable role. Analogies can help strip away emotional or politically charged contexts, enabling clearer assessment of our intuitions. By reducing complex scenarios to simpler terms, analogies offer clarity in isolating moral principles, even if they must eventually be supplemented with careful analysis of the unique features of state-level conflicts. My argument here, then, is not that analogies are useless—indeed, they are often essential—but rather that, in the specific context of proportionality and SSI use, analogies between individual self-defense and state-level actions become counterproductive and misleading.

A reason to believe that the individual analogy for self-defense does not map onto state level conflicts is that such analogies do not properly account for the moral obligations of the state. That is, the state has a different set of moral obligations towards its own citizens than a person has toward their own life. In this context, moral obligations may be the wrong framing. In truth, the correct framing might more accurately be that the state has a set of moral obligations toward its own citizens, while the individual has a set of moral allowances.²²⁶ Consider the following derivation of a set of trolley problems that Frowe uses in her paper, “Lesser-evil Justification for Harming: Why we’re Required to Turn the Trolley”:

Trolley with Grenade: A runaway trolley is heading to where it will kill five people. Pedestrian is standing next to a switch that will divert the trolley down a sidetrack, saving the five. However, the trolley will then kill Workman, who is trapped on the sidetrack. Pedestrian diverts the trolley, saving the five. The trolley is now heading towards Workman. Workman can destroy the trolley by throwing a grenade that will also kill Pedestrian as a side-effect.²²⁷

For this scenario, Frowe believes that the Workman does not have a right to throw the grenade. This is due to a requirement thesis that states, “In ordinary cases, an agent is morally required to act on lesser-evil justifications for harming for the sake of others, unless (a) acting would impose some very significant psychological cost on her, or (b) an alternative action would be equally or less harmful overall.”²²⁸ The power of the requirement thesis comes from the idea that in normal circumstances, we have a requirement to rescue someone if we are able to do so. This seems intuitive and uncontroversial. Since there is a moral requirement to save people, and based on lesser-evil justifications for actions, then Pedestrian is morally required to flip the switch; failing to do so is

²²⁶ This was briefly referenced in both Chapters 1 and 2, but those arguments are expanded here.

²²⁷ This is a combination of two trolley problems presented by Frowe, Trolley and Later Grenade, from Frowe, “Lesser-Evil Justifications for Harming,” at 460, 475.

²²⁸ *Id.* at 473.

morally blameworthy. Following this, Pedestrian cannot be liable to harm from Workman, even though Workman is innocent, and is not himself liable to be killed. Now, some of this might be controversial, but let us just assume that all of this is correct and aligns with our intuitions.

Given the setup of this problem, it might map quite well onto some problem associated with the use of SSI, with the trolley being climate change, etc. However, the problem is that there is a fundamental difference between what the individual actors are *allowed* to do and what states are *required* to do. In the Trolley with Grenade hypothetical, the Workman is limited in what he can do to save his own life. It is essentially his right to his own life, versus the Pedestrian's right to their life. Since Pedestrian was forced into their action—there was a moral requirement—then Workman does not have a right to prioritize his own life over their life. This is a common theme in self-defense type scenarios, where a person is not allowed to kill an innocent person in order to save their own life, all other things being equal. The problem is that when we consider state actors, this same concept of not being allowed to prioritize themselves over another state does not track. States have a moral obligation that is owed to their own citizens. It is much less of an analogy to a person and their own life, than it is an analogy regarding the obligations a parent owes a child, or that a corporation owes its shareholders. In short, a state has an obligation to prioritize its own citizens over the citizens of another state, whereas an individual does not have the same obligation regarding their own life.

There are many ways to consider this issue, but the one I find most powerful is the right a person has to sacrifice their own life for the life of another. If we imagine a scenario where a person runs into traffic to push someone clear of oncoming traffic, sacrificing their own life in the process, then we might say they had a right to do so, or they were allowed to do so. It would be odd for us to condemn them for their sacrifice. It is their life, and we generally commend them for their sacrifice and hold them up as a moral exemplar. On the other hand, this sort of analogy mapped onto a state evokes different intuitions, at least for me. Imagine a state that has enough resources for itself, but its neighbor state is in the middle of a horrible famine. If the state with plentiful resources sends all of those resources to its neighbor, basically taking the starvation of its neighbor on its own shoulders, we would not praise such action. Instead, we would criticize a state starving its own citizens to save the citizens of a neighboring state. The reason is that a state owes an obligation to its own citizens that outweighs any obligation to the citizens of another state. We can quickly adapt this example to non-state examples as well. Consider the obligation of a corporation to its shareholders.

A corporation has an obligation to its shareholders in much the same way that a state has an obligation to its citizens. We would not praise or even be morally ambivalent toward a corporation that intentionally destroyed its own well-being in order to save another company. The relationship between a corporation and its shareholders (the government and its citizens) is one where the shareholder is of utmost importance. Phrases such as “Shareholder primacy is a foundational concept” are common if not standard.²²⁹ Corporations exist primarily to serve the needs and objectives of their shareholders. Decision-making at the highest levels of corporate management should primarily focus on maximizing shareholder value and protecting shareholders from loss (harm).²³⁰ Imagine if Wal-Mart had signed over properties, trade practices, and products in order to keep Sears from failing. This is something for which we would condemn Wal-Mart, because they have an obligation to their own shareholders that is far greater than any obligation owed to the shareholders of another company. There is a type of loyalty that is owed to a shareholder by the corporation itself, and this loyalty is analogous to the loyalty owed by a state to its own citizens.

Finally, consider the obligation between a parent and a child. If a parent must choose between saving the life of their own child or saving the life of another child, all other things being equal, the parent has a moral obligation to save their own child. This much is relatively uncontroversial. But the climate case does not present this structure. The relevant question is not whether a state may prefer its own citizens when distributing a scarce good (protection). The relevant question is whether a state may impose harm on the citizens of other states in order to protect its own. These are distinct moral claims, and it is important not to run them together. To make the parent analogy track, we would need to ask not whether a parent may choose their own child over another, but whether a parent, under threat, may use another child as a means of protecting their own. Most would find that impermissible, and rightly so. The analogy therefore does not straightforwardly support the claim that states may impose SSI-related harms on foreign populations to ensure their own survival.

However, the disanalogy between the parent case and the state case cuts in the other direction as well. A parent who uses another child as a shield is instrumentalizing that child, treating them as

²²⁹ Robert J. Rhee, “A Legal Theory of Shareholder Primacy,” *Minnesota Law Review* 102, no. 5 (2018): 1951–2016.

²³⁰ John Armour, “Shareholder Rights,” *Oxford Review of Economic Policy* 36, no. 2 (2020): 314–340, <https://doi.org/10.1093/oxrep/graa005>.

a mere means. A state that deploys SSI to prevent its own annihilation is not using foreign populations as a means. It is undertaking a defensive action whose side effects happen to be globally distributed. The harm to foreign populations is not the mechanism by which the state defends itself; it is a foreseeable but unintended consequence of atmospheric intervention. This distinction matters for proportionality, because the moral constraints on instrumentalizing persons are stricter than the constraints on imposing side-effect harms. The question, then, is not whether the state may use foreign citizens as instruments of its defense, which it may not, but whether the foreseen side-effect harms of SSI are proportionate to the good of preserving a political community facing extinction. That is a genuine proportionality question, and it is one that JWT is equipped to answer, but only if we resist collapsing it into the simpler question of whether a state may prefer its own citizens. It may. But the preferential obligation does not, by itself, settle the proportionality question. What settles it is the severity and nature of the threat, the availability of alternatives, and the magnitude and distribution of the harms imposed, all of which must be assessed on their own terms.

Before developing the historical support for this asymmetry, let me restate where the argument now stands. The three analogies (sacrifice in traffic, corporation and shareholders, parent and child) converge on the same conclusion: a state's relationship to its citizens has a different structure than an individual's relationship to her own life, and the moral permissions and constraints that follow from that structure differ accordingly. What follows is not a separate argument but a deepening of that one: the political tradition has long recognized this asymmetry, and the recognition itself is part of what makes the asymmetry plausible. Historical support for the principle that states owe special obligations to their own citizens is abundant, stretching from Augustine through Hobbes and Locke to twentieth-century realists such as Hans Morgenthau. But the existence of this obligation does not answer the harder question of what a state may do to others in fulfilling it. That question requires the kind of proportionality analysis that just war theory provides, and it is to the limits of that analysis that this chapter is addressed. We see evidence of forms of this obligation that a state has for its citizens as far back as Augustine, at least.²³¹ Moving forward, this thread of obligation is

²³¹ Augustine, *The City of God*, trans. Henry Bettenson (New York: Penguin Classics, 2003), bk. XIX, chaps. 17, 21.

present in Hobbes' *Leviathan* and can be found in the writings of John Locke as well.²³² This thread shows up in the 20th century in the writings of realists such as Hans Morgenthau.²³³

Morgenthau explores the concept of sovereignty and posits that the foremost objective of the state is to protect the rights of its citizens, and by extension to ensure its own continued existence. In other words, one of the most fundamental rights of all people is a form of self-rule, and a loss of sovereignty undermines that self-rule. What is more, there are very few restrictions to what a state is allowed to do to ensure its continued existence. To understand why this is the case, consider how Hobbes characterized the state of nature as “of every man against every man.”²³⁴ From Hobbes' perspective, without a social contract people live in a state of anarchy, and in this state has the right to do anything necessary to protect themselves and ensure their own survival. Morgenthau simply moves the focus from man to state and argues that the same line of reasoning applies at the state level as well. States exist in an anarchic system, and as such have the right to do anything necessary to defend themselves and ensure their own survival. Consider how it is that we move beyond Hobbes' state of nature. We do so by giving up certain rights, and then in turn being given certain benefits and protections. These benefits and protections are administered by the authority to which we surrendered our state of radical autonomy. The problem is that at the state level, there is no authority to which we have surrendered. There is nothing that exists with a higher authority than the government of each state. Therefore, states still have those “radical freedoms” and they are allowed, or more accurately, required, to defend their sovereignty.

In addition to Morgenthau, Kenneth Waltz also explores the idea of an anarchic system for which there exists no power above the state level and goes so far as to use the language of anarchic. Waltz states that, “Among states, the state of nature is a state of war.”²³⁵ That is not to say that states are constantly at war, or course, but simply that each state must be constantly vigilant in deciding what is best for itself, and as such war, while not constant, should be expected and can occur any time. He further states:

²³² Thomas Hobbes, “Of the Rights of Sovereigns by Institution,” in *Leviathan*, ed. Edwin Curley (Indianapolis: Hackett Publishing Company, 1994), 110–118; John Locke, *Second Treatise of Government*, ed. Peter Laslett (Cambridge: Cambridge University Press, 1988), chaps. 8, 11, 14.

²³³ Hans Morgenthau, *Politics Among Nations: The Struggle for Power and Peace* (New York: Alfred A. Knopf, 1949), 243–249.

²³⁴ Hobbes, *Leviathan*, at 74.

²³⁵ Kenneth Waltz, *Theory of International Politics* (Reading, MA: Addison-Wesley, 1979), 102.

A government, ruling by some standard of legitimacy, arrogates to itself the right to use force—that is, to apply a variety of sanctions to control the use of force by its subjects. If some use private force, others may appeal to the government. A government has no monopoly on the use of force, as is all too evident. An effective government, however, has a monopoly on the legitimate use of force, and legitimate here means that public agents are organized to prevent and to counter the private use of force. Citizens need not prepare to defend themselves. Public agencies do that. A national system is not one of self-help. The international system is.²³⁶

Here again we see the idea that citizens of a state are generally disallowed from using violence because that right is reserved for the state. This is accepted because when there is a situation where a person needs protection, even protection that requires violence to ensure, then the government is there to provide that protection and that violence. On the other hand, the state has no such recourse. There is no “next level up” that a state can petition for protection. The state is akin to man, walking alone in the wilderness, solely responsible for his own protection and survival. Yet even as we affirm these expansive state prerogatives, we must remain vigilant against a deeper moral danger. Stephen Gardiner cautions that an existential crisis like climate change can “subvert our moral discourse to our own ends,” making us “particularly vulnerable to moral corruption.”²³⁷ In a perfect moral storm, the rhetoric of a “lesser evil” may become a convenient moral license—effectively an exemption from normal ethical constraints under the guise of necessity. The worry is that framing geoengineering as the “less bad” option could dull our moral sensitivities, justifying acts we would ordinarily condemn. In short, the specter of national extinction might tempt even principled actors to relax proportionality restraints, vindicating revisionist fears that emergency ethics invite corrupt reasoning if we are not exceedingly careful.

Taking stock: I have argued that strict revisionist proportionality, as developed by McMahan and Rodin, would disallow SSI even in extreme cases. But that conclusion rests on a methodological mistake, the use of individual-level self-defense analogies to ground state-level proportionality judgments. The three analogies I have developed and the historical political tradition I have surveyed converge on a single claim: states have a moral structure that individuals lack, and that structure permits—indeed in some cases requires—actions in self-defense that individuals could not permissibly take. The Gardiner caveat reminds us that this conclusion is dangerous without strict guardrails.

²³⁶ *Id.* at 103-104.

²³⁷ Stephen M. Gardiner, “A Perfect Moral Storm: Climate Change, Intergenerational Ethics and the Problem of Moral Corruption,” *Environmental Values* 15, no. 3 (2006): 398.

Identifying what those guardrails must look like is the task of the remainder of this chapter and the next.

6. Defending the State Level Framework

While I believe these are compelling reasons to reject the individual analogies that would disallow violations of proportionality, I made use of other analogies that others might consider problematic. That is, part of my criticism of the individualistic analogies tied to self-defense and proportionality involved further use of analogies, which I claimed better represent the relationship between states and the use of SSI. Perhaps that is not the case and I have just swapped one set of bad analogies for another. I do not believe this to be the case.

Consider what we are actually discussing when we talk about proportionality and the use of SSI. I have generally focused on small island states using SSI and causing harm to other states but let us consider the opposite. Imagine some small state that is suffering from extreme drought and heatwaves that are beyond anything else that they have ever experienced. They lack the wealth for mitigation and face the prospect of starvation and political upheaval. In hopes of disrupting both issues, they decided to unilaterally implement SSI, but this implementation in hopes of saving hundreds of thousands of lives will potentially harm many millions of people. Included in those harmed will be the low-lying islands that rely on fisheries that are already stressed due to heat, and SSI has the potential to increase ocean salinity.²³⁸ So, we have a clear violation of proportionality, where hundreds of thousands of lives are being saved at the cost of potentially millions of lives, along with the potential destruction of fellow climate innocent states. The question is, how does a problem of this complexity map onto the relationship between parents and children, or the relationship between corporations and shareholders?

Let us analyze the corporate analogy first. The above story would be roughly equivalent to a corporation attempting to save its shareholders from losses by engaging in some practice that might harm the shareholders of other corporations and might even put some of the weakest corporations at risk of bankruptcy and outright failure. From a strict corporate perspective, this is not any sort of

²³⁸ Ocean salinity affects ocean currents and there is at least some concern that rapid cooling could cause a reverse effect and cause some areas to carry much more salinity. See Copernicus Marine Service, “New Sea Surface Salinity (SSS) Products from Soil Moisture and Ocean Salinity (SMOS) Satellite,” January 15, 2023, <https://marine.copernicus.eu/news/new-sea-surface-salinity-sss-products-soil-moisture-and-ocean-salinity-smos-satellite>.

violation that would typically be disallowed. However, while states are certainly in a kind of competition with each other, that competition generally does not extend to annihilation—or at least, if it does, we generally recognize something morally wrong is taking place. Thus, mapping the corporate analogy onto SSI might initially appear problematic because it introduces risks that seem morally unacceptable.

My response to these concerns is twofold. First, as previously explored, when a state is engaged in a morally justified war, or something sufficiently analogous to war that the same moral and legal rules apply, we permit the state to act in ways normally forbidden. Under such extraordinary circumstances, states can justifiably impose risks or harms that would otherwise be impermissible. Second, while the corporate analogy remains imperfect, it still more accurately reflects the dynamics states face than the individual analogies, which categorically forbid such actions. Because states exist in a competitive international environment, akin to corporate competition rather than purely individual moral scenarios, traditionalist just war theory provides the most suitable framework for handling proportionality. As argued earlier, under a traditionalist framework, proportionality cannot meaningfully be violated if the only successful defense inevitably involves actions that would otherwise appear disproportionate. Instead, the moral and legal responsibility shifts appropriately to the aggressor state whose initial actions made such defensive measures necessary.

The parent/child analogy is a little more difficult—and a lot more uncomfortable. When applied to our story above, it is not just choosing between saving your own child versus saving the life of another child. Instead, when considering proportionality, it is the idea of saving your own child when you know that the actions you take in saving your child will harm several other children and with the likelihood of killing at least some of them. My intuition is that this should still be allowed, but many will likely not share my intuition. My answer here is that the reason we are not allowed to do such a thing is that we are in a system that takes such a decision out of our hands. Were we in the state of nature, then such an action would be allowed. Further, the story is even more complex, since some of the children that will be harmed had parents that brought about the situation that your child is facing, and the other parents who are innocent and whose children might be killed are also taking steps to save their own children that will likely harm or kill your child. The very description of the problem in terms of state-level SSI evokes a feeling of anarchy and lawlessness that is best explained by Hobbes' state of nature language. However, we are not in a state of nature,

and there are higher authorities who have the obligation to make such decisions about whose child gets saved and how the harm should be spread around. Consider the rules and decisions that govern issues such as organ donation and transfer, and how they might be viewed in a similar light to the situations above.

In discussing the parent/child analogy, I have once again referenced the issue of having a higher authority and how some actions become permissible when there is no such authority. This looks back on my claims from Morgenthau and Waltz. One counterpoint to this claim might be that we have an international community, and the existence of this community implies a sort of higher obligation. In other words, I am claiming that states are allowed to act as if they are in the state of nature because no other authority exists higher than the level of the state, and therefore nothing exists with an obligation to mediate such actions. However, this obligation cannot be recognized without some authority to which certain rights might be passed so that it can grant the benefits and protections for which it is formed. Our current system uses the United Nations in this role, but the UN is a dog with very little bark, and even less bite. Consider the war between Russia and Ukraine. Very nearly every UN member state objects to the Russian invasion of Ukraine, but yet can do nothing about it through the UN because Russia is a permanent member of the Security Council and can veto any resolutions to which it objects.²³⁹ Similarly, the ongoing and incredibly deadly conflict between Israeli defense forces and Palestinians living in Gaza continues as of this writing, with the international community calling for a cease-fire. The problem is that calls for a cease fire and criticism of Israel for tactics being used cannot move beyond these calls and criticisms because the UN has no true authority. If the UN had any real authority, it could most certainly deal with a conflict that is relatively small, at least on a global scale, and involves a total population smaller than dozens of the world's most populous cities.²⁴⁰ The only reasonable conclusion is that there is

²³⁹ See, for example, the UN news story shortly after the invasion of Ukraine. United Nations, "Russia Vetoes Security Council Resolution Condemning Attempted Annexation of Ukraine Regions," September 30, 2022, <https://news.un.org/en/story/2022/09/1129102>.

²⁴⁰ The total area of the state of Israel and the Palestinian territories is slightly greater than the state of Vermont and the population that is less than half that of Mexico City. See: "Compare Sizes: Israel vs Vermont," *CompareArea*, accessed April 2, 2024, https://www.comparearea.org/ISR+US_VT; "Israel Population," *Worldometer*, accessed April 2, 2024, <https://www.worldometers.info/world-population/israel-population/>; "Mexico City Population 2024," *World Population Review*, accessed April 2, 2024, <https://worldpopulationreview.com/world-cities/mexico-city-population>.

no authority greater than that of the individual state, and this supports the conclusions of Morgenthau and Waltz.

7. Conclusion

This chapter has examined proportionality as the decisive moral test for the permissibility of SSI within just war theory. While proportionality often appears as a constraining principle, it also exposes where just war reasoning begins to fracture under global conditions like climate change. Traditionalist thinkers such as Walzer allow proportionality to yield when survival itself is at stake, whereas revisionists such as McMahan interpret it as an absolute moral limit. In the climate context, both positions encounter an ethical paradox: proportionality cannot demand that a state consent to its own extinction, yet it also cannot permit indiscriminate global harm.

If just war theory is to remain action-guiding, the only defensible path lies between these extremes. A small island state facing existential loss may satisfy proportionality, and thus the moral right to self-defense, if and only if its use of SSI is strictly constrained by two conditions: first, that it be governed through transparent international oversight and cooperative consultation; and second, that it include remedial duties toward those harmed by its side-effects. Under such conditions, SSI may be conditionally permissible within just war theory—not as an act of aggression, but as a last-resort defense against annihilation.

This conclusion does not license moral recklessness. As Stephen Gardiner warns, the language of “lesser evil” invites moral corruption, dulling our sensitivity to injustice when threats appear existential. To avoid that corruption, proportionality must retain its moral bite even in emergencies, reminding us that necessity is not moral absolution. Likewise, Anja Karnein’s work on climate justice and non-ideal responsibility underscores the same point: when traditional moral frameworks fail to capture the structure of climate harm, we must build new normative models that allocate duties and accountability under conditions of global failure.²⁴¹ Her insight reinforces that SSI, if undertaken at all, must operate within a framework of shared governance and reparative obligation rather than unilateral desperation.

²⁴¹ Simon Caney, “Climate Change and the Duties of the Advantaged,” *Critical Review of International Social and Political Philosophy* 13, no. 1 (2010): 203–228, <https://doi.org/10.1080/13698230903326331>; Anja Karnein, “Climate Change and Justice between Nonoverlapping Generations,” *Global Justice: Theory Practice Rhetoric* 8, no. 2 (2015): 43–65, at 43–48.

These arguments show that just war theory need not collapse under the weight of climate change; it can evolve. Proportionality, properly reconstructed, does not prohibit defensive geoengineering outright but binds it to a demanding ethic of restraint, responsibility, and cooperation. In this way, the principle that once limited war can also discipline the politics of planetary survival.

Chapter 5: Repairing Just War Theory

1. Introduction

Just war theory has provided a moral framework for evaluating war for well over a thousand years. This framework seeks to balance the extreme violence, destruction, and massive harm that comes from war, with ethical principles such as justice and fairness. Originating with the writings of Augustine and moving through history until reaching the modern writings of Walzer, McMahan, and others, just war theory had to evolve to meet the changing nature of war. This evolution had to account for differences in types of conflict, changing technology, and the complexity of a global political climate. However, the interconnectedness of the global community when considering the problem of climate change and related harm has stretched this framework to a potential breaking point. This leaves us to consider whether just war theory has reached a point with regard to global issues such as climate change and geoengineering where it is no longer useful, or is there some change—some further evolution—that can account for these new challenges.

In the first section of this chapter, I trace the historical evolution of just war theory, showing how it has adapted to changing forms of warfare over the centuries. From Augustine's early formulations to Michael Walzer's modern interpretations, just war theory has evolved to address new political and technological realities. Just as war and political relationships have evolved, so too has just war theory. Today, however, the theory faces new challenges from the rapid development of geoengineering technologies, the global nature of climate change, and the complex web of potentially conflicting claims of self-defense among states.

The remaining sections of the chapter seek to address these challenges by proposing modifications to just war theory and exploring the necessity of international governance. First, I explore repairing just cause, expanding its criteria to account for defensive actions against global environmental threats by considering a model of cooperative defense. Next, I explore the issue of proportionality, in particular a tiered approach that considers the unique, long-term environmental impacts of geoengineering and propose a new category of proportionality beyond narrow and wide. Finally, I argue that traditional notions of sovereignty must be reimagined in the context of global environmental governance. I advocate for an authoritative international body to regulate and mediate the use of geoengineering technologies. These proposed changes expose the limitations of just war theory when applied to contemporary global threats. While the theory can and should be adapted

to better address the realities of climate change, it is ultimately insufficient without a robust governance structure that can enforce ethical norms and prevent unilateral abuses of power. An empowered international body, with the authority to oversee geoengineering and mediate environmental conflicts, is essential to maintaining global justice when considering climate change.

2. The Evolution of Just War Theory

Saint Augustine of Hippo is a monumental figure in Christianity. He was alive, and influential, in the various councils that led to the acceptance of the Bible as we generally know it today. He is no less monumental in his influence on just war theory.²⁴² In particular, Augustine struggled with the idea of violence set against the backdrop of a belief in a divine creator whose teachings focused on love and peace.²⁴³ This was especially true of the violence associated with war. It is difficult, and one might think impossible, to reconcile the horrors of war with teachings such as, “Blessed are the peacemakers: for they shall be called the children of God.”²⁴⁴ Similarly, the idea of self-defense is undermined by teachings such as, “Ye have heard that it hath been said, An eye for an eye, and a tooth for a tooth: But I say unto you, That ye resist not evil: but whosoever shall smite thee on thy right cheek, turn to him the other also.”²⁴⁵ When considering these verses, a person might assume that it is wrong, from the perspective of theology, to ever engage in any sort of violence. So, the answer is simply pacifism, to accept that there will be those who attack or harm others, and it is wrong to respond with any sort of violence. What is more, this view is not an antiquated and abandoned set of beliefs. There are those that still advocate for pacifism and develop serious arguments regarding the moral standing of pacifism.²⁴⁶

²⁴² Augustine is often called the father of just war theory. Some object to this framing, pointing to just war theory foundations from the ancient Greeks and others. Brian Orend points to these earlier civilizations as the true foundation. However, I find it hard to take these sorts of claims serious given the conclusions by many early thinkers. For example, Aristotle's work on just war theory can be interpreted to see the capturing of slaves as a just reason to go to war, in particular if those captured have a natural inclination toward being slaves. See Brian Orend, “A Sweeping History of Just War Theory,” in *The Morality of War* (Peterborough, ON: Broadview Press, 2006), 9–30; Aristotle, *Politics*, trans. Benjamin Jowett, bk. I, 1255a, in *The Complete Works of Aristotle*, ed. Jonathan Barnes (Princeton, NJ: Princeton University Press, 1984).

²⁴³ Roland Bainton, *Christian Attitudes Toward War and Peace* (Nashville: Abingdon Press, 1960), 62–65.

²⁴⁴ Matthew 5:9 (King James Version). I do understand that the Bible did not exist in the exact form quoted here. However, these verses, similar verses, or some forms of these verses were available to Augustine and were a part of his understanding of Christ's teaching.

²⁴⁵ Matthew 5:38–39 (King James Version).

²⁴⁶ See, among others, Blake Hereth, “Moral Excuse to the Pacifist's Rescue,” *Journal of Pacifism and Nonviolence* 2, no. 2 (2024): 90–121.

While pacifism seems to be the answer, Augustine believed that this view was at odds with the idea of an earthly kingdom of God. Augustine believed that there should be peace, and this peace was a divine order. Therefore, it may be necessary to commit violence in order to achieve this peace. James Johnson explains this, “For Augustine, the earthly city is not merely a stage in the human pilgrimage to the City of God, but it is also the place where the divine order is to be reflected and maintained.”²⁴⁷ So, for Augustine, there is a divine mandate to engage in the most violent of activities, that is war, in order to achieve God’s will on Earth. To engage in pacifism when the cause for war is just would be a sin and would be counter to the will of God. Not only did the extreme violence and massive destruction of war not undermine a peace-loving God, but this peace-loving God demanded that in some circumstances this violence and destruction was required. This does bring up the question of figuring out what constitutes those particular circumstances, or put in more modern terms, what constitutes a just war.

When considering just cause, Augustine focuses again on peace and God’s will.²⁴⁸ This view can rightly be understood as just an extension of the reason why violence can be used to gain peace. Johnson writes, “Augustine’s understanding of a just cause for war was primarily centered around the concept of peace—both the restoration and maintenance of peace. He considered wars fought for these purposes as having a just cause, as they aimed at preserving the divine order in the world.”²⁴⁹ We can see here that both the reason we can fight a war, and having just cause to fight a war, are very nearly the same issue for Augustine. Wars can only be fought to achieve the divinely required peaceful state. So, if a war is fought in order to gain wealth, or to gain territory, or as revenge to punish some insult, then the war is not just. However, if the war is fought in order to preserve the peace, or to restore peace, then that is a goal that is part of God’s will and is a just war that should be fought.

Augustine also introduced the concepts of legitimate authority and right intention. Following still the drive of following God’s will, he held that in order for a war to be God’s will, it must be the

²⁴⁷ James Turner Johnson, *Just War Tradition and the Restraint of War: A Moral and Historical Inquiry* (Princeton: Princeton University Press, 1981), 45.

²⁴⁸ Augustine did not use the language of just cause, or any of the other terms that we use in modern explorations of just war theory. Indeed, he did not even use the language of “just war theory.” However, I will reference these terms and situate them within Augustine’s writing, as well as later contributors, as if the term were present. This is being done for clarity and ease of writing and should not be taken as a belief or as evidence that the referenced theologians and philosophers used the terms themselves.

²⁴⁹ Johnson, *Just War*, at 49.

case that the person deciding to go to war must be someone who is ordained by God to hold that authority. That is, only legitimate leaders can decide to go to war, and the only legitimate leaders are those that are put in that position of power by God. Johnson explains, “Augustine held that only a legitimate authority, which he defined as those in positions of political power sanctioned by God, had the right to declare war. This ensures that the use of force is regulated and aimed at the common good, rather than personal gain or vendetta.”²⁵⁰ This can be viewed through the backdrop of the Catholic Church and the power of the pope. Those leaders that were not sanctioned by the Catholic church were not legitimate, and as such could not wage a legitimate war, even in defense. This would seem to suggest that a state with a leader approved by the Catholic church could simply attack any non-ordained state at will and would be correct in doing so. However, Augustine foresaw this problem and addressed it as well.

To guard against this worry, Augustine stipulated that a war must only be fought with the right intention. So, as previously mentioned, a war fought in defense of one’s land against an aggressor, or a war fought to bring peace and maintain the will of God, these are wars that are fought with the right intention. However, if a war is fought for gain—no matter the type of gain—then that violates the need for the right intention. Here again, Johnson addresses this by stating, “Augustine was concerned that even if a war had a just cause and was declared by a legitimate authority, it could still be morally problematic if the intentions behind it were corrupt. He stressed that the intention behind war should be to restore peace and justice, not for conquest or revenge.”²⁵¹ This would prevent a king that had the pope’s approval from attacking a neighboring state where the leaders did not have the pope’s approval to take advantage of the lack of legitimate authority of the defenders.

Of course, there are certainly concerns that linger. The concept of right intention could, in itself, be a problematic issue. For example, what if the intention of a ruler is to promote the earthly kingdom of God, and the best way to do so is to rid the world of those who do not believe, or at least to rid the world of those leaders who do not believe. This again seems like *carte blanche* to attack all who are not ruled by Christian kings (or emperors, etc.), though this may have been more of a function than a fault for many early Christian thinkers. Still, these concepts employed by Augustine

²⁵⁰ *Id.* at 52.

²⁵¹ *Id.* at 55.

show that his primary concern was that of reconciling the words of peace taught by the very Bible he had a hand in helping develop with the violence and destruction of war.

During Augustine's time, Christianity was still in its (relative) infancy. He was writing during the formation, at a time when Christianity was becoming accepted and then the official religion of the Roman empire. As such, his writings on just war theory reflect his concern with reconciling the teachings of the church with violent concepts such as war. By the time of Aquinas, several centuries later, the questions that needed to be addressed by Augustine were long since passed.²⁵² Instead of the formation of the Catholic Church, Aquinas lived when the Church was well established but faced challenges. These challenges included the Mongol invasions, the Seventh Crusade, and the general violence and unrest of feudal Europe.

Like Augustine, Aquinas was concerned with just cause for war. While his concerns were similar to Augustine in that he was concerned about the just reasons to fight a war from within the Christian framework, his concerns extended beyond and added more depth to Augustine's work. This needed depth was a product of the changed landscape of the world. The Roman Empire was no longer the governing force for much of Europe, such that just cause could generally be considered in light of the Church's direction. Instead, you had many dozens of rulers and kings that all claimed various rights ordained by God, and oftentimes saw each other as a means of getting ahead and expanding wealth. This more complex relationship between the various kings and rulers required a more complex understanding of the just causes to go to war. One way that Aquinas sought to explain just cause, was to greatly restrict cases where a ruler might claim they had just cause. One way to do this was to restrict just cause to those cases that were legitimate response to outside aggression, or more simply, self-defense. Aquinas wrote, "The sovereign has the right to authorize resort to the sword in defense against attack under way or immediately offered; even private persons have such a right."²⁵³ So we can see that he is restricting the concept of just cause to self-defense but is going further and arguing that the threat has to be immediate.

²⁵² Gregory M. Reichberg, "Thomas Aquinas (1224/5-1274)," in *Just War Thinkers: From Cicero to the 21st Century*, ed. Daniel R. Brunstetter and Cian O'Driscoll (London: Routledge, 2017), 50-63; Gregory M. Reichberg, Henrik Syse, and Endre Begby, eds., *The Ethics of War: Classic and Contemporary Readings* (Malden, MA: Blackwell Publishing, 2006).

²⁵³ Johnson, *Just War*, at 54.

The development of the nation-state also brought the issue of sovereignty into play. That is not to say that sovereignty was ignored prior to Aquinas and the rise of the nation-state, but the various kingdoms did require a more mature understanding of the concept of sovereignty and who could declare war. To this end, Aquinas says, “[I]t is not the business of a private individual to declare war, because he can seek for redress of his rights from the tribunal of his superior. Moreover, it is not the business of a private individual to summon together the people, which has to be done in wartime. And as the care of the common weal is committed to those who are in authority, it is their business to watch over the common weal of the city, kingdom, or province subject to them.”²⁵⁴ In other words, in order to have legitimate authority to declare war, you must actually be a ruler of people, the person (or group of persons) who can rightfully gather an army, and the person who has an obligation to the wellbeing of the citizenry over which you rule.

Another important point that can be garnered from the above quote, is the idea that one of the reasons the sovereign is allowed to declare war is that there is no other redress. That is, there is no higher authority to whom the sovereign can appeal. Common citizens, and even officials and lesser rulers, have another level of authority above them (or many more levels of authority above them). For this reason, and in this way, this is where part of the power of the sovereign to declare war is based. This again is linked to legitimate authority, because even if you were a noble in medieval Europe, with the ability to require your vassals to fight for you, and even if you had good cause to do so—a noble from a nearby kingdom is encroaching on your land, stealing your crops, etc.—you still do not have the right to declare war on the nearby kingdom, or even the nearby noble, because there is another layer in the structure above your level to which you can appeal.

Both Augustine and Aquinas approached just war theory as a moral and theological issue. Their work focused on first justifying the violence of war, and then establishing a moral framework to guide action in the event war was necessary. Hugo Grotius, while maintaining just war theory as a moral issue, focused more on war as a legal issue based in natural law and as an issue of international law. He further fleshed out issues such as right intention, stating, “War is justifiable only for the enforcement of rights; and when undertaken for this reason, it must be accompanied by a right intention, that is, an intention to perform a duty, to obtain a right, or to bring about some

²⁵⁴ Thomas Aquinas, *Summa Theologica*, II-II, Q. 40, Art. 1.

good.”²⁵⁵ Here, and throughout his writings on war, he relied on a natural law understanding of rights. His adoption of rules of war and arguments that there needed to be international laws that dictated rules for conflict between states, brought just war theory into the modern age. This legalistic understanding of just war theory is still the case today, with Walzer, McMahon, and others understanding just war theory as both a moral and legal framework.

If we once again step forward through history and look at just war theory from the perspective of modern thinkers, we see a shift in focus that reflects changes in the nature of war itself. Walzer, for example, was not concerned with understanding the relationship between the violence of war and a peaceful creator, as Augustine was, nor was he focused on establishing a legal framework for war, as Grotius had done. Instead, by the time Walzer was writing, the legal structures surrounding war were already firmly established, and the ethical challenges of warfare had taken on new forms.²⁵⁶

The horrors of war, in Walzer’s time, had evolved to take on even more violent and far-reaching consequences. Modern warfare introduced technologies and strategies that forced a rethinking of the core principles of just war theory, particularly in relation to proportionality and the protection of non-combatants. For instance, the ability to drop bombs from aircraft indiscriminately, as seen in the firebombing of Dresden or the atomic bombings of Hiroshima and Nagasaki, created unprecedented levels of destruction. The principle of proportionality took on new significance in the face of such devastating capabilities. Walzer’s work responded to these developments by emphasizing the need for stricter adherence to the principles of proportionality and discrimination. In his view, even in a just war, the use of force must be limited to avoid unnecessary suffering, particularly to civilians.²⁵⁷

Moreover, the speed at which modern states could mobilize their forces complicated traditional concerns around last resort and imminent threat. In earlier times, wars were often preceded by prolonged periods of diplomatic negotiation or slow mobilization, but with the advent of modern militaries and nuclear arsenals, the window for preemptive or defensive action had drastically shortened. Walzer recognized that these changes necessitated a re-examination of the principle of last resort. For instance, a state under the threat of nuclear attack may not be able to wait

²⁵⁵ Hugo Grotius, *On the Law of War and Peace*, ed. Stephen C. Neff (Cambridge: Cambridge University Press, 2012), bk. II, chap. I.

²⁵⁶ Walzer, *Just and Unjust Wars*.

²⁵⁷ *Id.* at 151-174.

until it is attacked before defending itself. Thus, the concept of preemptive strikes came to the forefront, challenging the traditional understanding of what counts as an imminent threat.

In addition to these technological advancements, the rise of non-state actors and guerrilla warfare presented further complications for just war theory. Wars were no longer confined to nation-states with clear borders and formal armies. Guerrilla fighters, insurgents, and terrorist groups often operated within civilian populations, blurring the lines between combatants and non-combatants.²⁵⁸ This made the application of just war principles, particularly discrimination, far more complex. Addressing these challenges, Walzer argued that even non-state actors had to be held accountable to the moral rules of war, and that state forces must exercise restraint in their responses to such groups. All of these challenges came with the change in war from armies meeting each other on a battlefield—often isolated from areas of population—to the concept of total war, where war involves an entire state against another state.

Walzer, along with McMahan and other modern theorists, adapted just war theory to meet the needs of a drastically changed world. Through all of this, we can see a thread of change. From Augustine developing the foundation that would become just war theory in order to understand the theological issues that the violence of war created, to Aquinas and Grotius refining and focusing concepts to meet the rise of the nation-state, to Walzer again refining the principles to account for the drastic changes in modern warfare, we see that just war theory was developed and adapted to be a useful framework to apply to the problems in each age. The question before us now is whether just war theory can once again be adapted to meet this new challenge of climate change and geoengineering. Given how much just war theory has changed, and in some of the ways it has changed, there is good reason to believe that it can be adapted. For example, one of the contributions of Grotius was to envision war as an international problem and that it needed a legal and moral framework to address this internationality. In much the same way, we now have a global connectedness through the environment that can really be looked on as a natural progression of what Grotius was facing. With these considerations in place, I spend the next two sections suggesting ways that both just cause and proportionality might be adapted to address the issues of climate change and geoengineering.

²⁵⁸ *Id.* at 176-198.

3. Repairing Just Cause

Recalling the exploration in Chapter 3, the conflict or breakdown of just cause arises most sharply in cases where two innocent parties, through no fault of their own, find themselves on a collision course when both act to stave off annihilation from climate change-related harms. This was illustrated by the case of two island nations, each pursuing different forms of geoengineering—such as stratospheric sulfate injection versus marine cloud brightening. Both states appear to have a legitimate just cause to act in self-defense, but their efforts threaten to cancel each other out. As explored previously, the different interpretations of self-defense—the culpability, causal, and responsibility accounts—all provide some guidance, but they are still grounded in individualist or state-centered frameworks.²⁵⁹ This approach assumes that each state has the right to defend itself, ignoring the broader global impact of its actions. However, in an interconnected world facing shared environmental threats, individualistic self-defense may no longer provide an adequate moral or practical framework.

Although my argument proceeds primarily within just war theory, proportionality judgments and remedial principles inevitably depend on deeper questions of global justice. Philosophers such as Henry Shue, Thomas Pogge, and Simon Caney have long argued that climate change exposes the moral limits of state-centered distributive models. Their work on fairness, burden-sharing, and historical responsibility clarifies that global harms cannot be evaluated without attention to background inequities in wealth and power.²⁶⁰ My focus on JWT is not meant to displace this literature but to complement it: by situating proportionality and self-defense within the broader global-justice conversation, I recognize that any defensible account of climate defense must also confront questions of equity, compensation, and the just distribution of environmental risks.

Before proceeding, a terminological clarification is necessary. Throughout this section, I use “individualist” to describe approaches to just war theory that treat each state as an independent moral agent with a self-contained right of self-defense. On an individualist model, the question of whether

²⁵⁹ Explored in Chapter 3. See Helen Frowe, *Defensive Killing*, at 27-29.

²⁶⁰ See Henry Shue, “Global Environment and International Inequality,” *International Affairs* 75, no. 3 (1999): 531-545; Thomas Pogge, “Severe Poverty as a Human Rights Violation,” in *Freedom from Poverty as a Human Right: Who Owes What to the Very Poor?*, ed. Thomas Pogge (Oxford: Oxford University Press, 2007), 11-53; and Simon Caney, “Cosmopolitan Justice, Responsibility, and Global Climate Change,” *Leiden Journal of International Law* 18, no. 4 (2005): 747-775.

a state may go to war is answered by examining that state's situation in isolation: does it have just cause, are its intentions right, is its response proportionate, and so on. The moral assessment is state-by-state. This is the model inherited from the classical just war tradition, and it is the model that both traditionalists and revisionists largely share, despite their disagreements about the foundations of defensive rights. I do not use "individualist" to refer to the revisionist claim that the morality of war reduces to the morality of individual persons, though the two senses are related: revisionist individualism about the moral foundations of war tends to produce state-level individualism about defensive rights, because if the permissibility of war is grounded in the aggregated rights of individual persons, then each state's defensive claim is assessed independently by reference to the rights of its own citizens. What I am contrasting with this individualist model is a cooperative model in which the permissibility of a state's defensive action is assessed not in isolation but in light of its effects on other states facing the same threat. On the cooperative model, just cause is not simply a right that each state holds independently; it is a shared condition that generates obligations of coordination and mutual restraint.

Just war theory, as has been traditionally understood, relies heavily on the idea that each state has the right to defend itself against external aggression or existential threats. This view works well in situations where the harm is distinct and limited in scope, such as in cases of direct military invasion or attacks. However, the global and diffuse nature of climate change disrupts this model. In the case of climate change, the aggression is collectively maintained by many high-emitting states, and the resulting threat is shared by multiple vulnerable states simultaneously. Worse still, the actions that one state takes to defend itself, such as the use of geoengineering technologies, may inadvertently cause harm to others, even if those others are also innocent victims of the same source of harm.²⁶¹

This is where the individualist model of self-defense falls short. If each state acts solely in its own interests, pursuing defensive measures without regard to the impact on other states, it leads to a form of competitive self-defense where states are pitted against one another. In this competitive model, every state acts justly according to traditional just war principles, but the outcome may still be unjust, as their actions could collectively worsen the global situation or cause harm to innocent states. For instance, if one island nation deploys SSI to prevent sea-level rise while another nation implements MCB to protect its fisheries, these actions could interfere with each other, leaving both

²⁶¹ This was explored more fully and in a more detailed manner in Chapter 3.

nations worse off than if neither had acted.²⁶² This form of mutually destructive defense illustrates the limits of an individualistic approach to self-defense in the context of global, interconnected crises.

To address these limitations, we must rethink self-defense in a way that acknowledges the global interdependence of states, especially in the context of climate change. Instead of focusing solely on the rights of individual states to defend themselves, we need to envision a form of cooperative defense emphasizing that states may have an obligation to defend each other or, at the very least, to coordinate their defensive actions in a way that maximizes collective survival while minimizing harm.

A cooperative defense model begins by recognizing that in the face of global threats like climate change, no state operates in isolation. The concept of shared responsibility becomes not only important, but ultimately necessary. Climate change is a collective problem that requires collective solutions, and the actions of one state inevitably affect the fate of others. Therefore, in cases where multiple states face existential threats, just cause must be reinterpreted not as the right of each state to unilaterally defend itself, but as a shared obligation to ensure that defensive actions benefit the global community. In this framework, the moral imperative shifts from self-preservation at any cost to a model that values the protection of global human life and sovereignty. States must recognize that their actions—particularly those with global reach, such as SSI—cannot be justified solely on the basis of their own survival if those actions threaten the survival of others. Self-defense, in this context, is not just about defending one’s own state, but also about ensuring that defensive actions do not unduly harm other states or undermine global stability.

One way to understand or support this cooperative defense model is to view defending against climate change as a global public good.²⁶³ The goal is something akin to climate reversal, or perhaps climate stability, in order to stave off climate change harms and provide a stable climate that is no longer a threat (analogous to eliminating a traditional military threat with the goal of peace and

²⁶² This is the example from Chapter 3. For more information about the unintended effects of marine cloud brightening, see Do-Hyun Kim, Ho-Jeong Shin, and Il-Ung Chung, “Geoengineering: Impact of Marine Cloud Brightening Control on the Extreme Temperature Change over East Asia,” *Atmosphere* 11, no. 12 (2020): 1345, <https://doi.org/10.3390/atmos11121345>; Graham Feingold et al., “Physical Science Research Needed to Evaluate the Viability and Risks of Marine Cloud Brightening,” *Science Advances* 10, no. 12 (2024): eadi8594, <https://doi.org/10.1126/sciadv.adi8594>.

²⁶³ Séverine Deneulin and Nicholas Townsend, “Public Goods, Global Public Goods and the Common Good,” *International Journal of Social Economics* 34, no. 1–2 (2007): 19–36, at 19–20, <https://doi.org/10.1108/03068290710723345>.

stability). Climate stability functions as a quintessential global public good: its benefits (a livable planet, predictable weather patterns, sea-level security) are non-excludable and enjoyed by all, and one country's enjoyment does not diminish another's. No single nation can secure a stable climate on its own; unilateral efforts such as SSI may improve one state's situation, but this improvement will not be global. This means defending the climate or defending against climate change—unlike defending against a military invader—demands broad cooperation rather than isolated force. Global warming's causes and effects ignore political boundaries, so any just cause related to it must likewise transcend the limits of national self-help. In ethical terms, the common good nature of climate stability imposes a mutual obligation: states must either succeed together or fail together in “producing” security from climate threats. The traditional *jus ad bellum* paradigm, centered on each state's right to wage war in its own defense, simply cannot generate a just or lasting solution to such a borderless collective danger.²⁶⁴

At this point in the argument, a clarification about the relationship between the war diagnosis and the cooperative defense model is necessary. In Chapters 1 and 2, I argued that climate change possesses the normative structure of unjust aggression: it is a foreseeable, avoidable, sovereignty-threatening process maintained by identifiable actors under conditions of knowledge. That argument stands. However, the fact that climate change satisfies the moral criteria for unjust war does not mean it fits the classical operational model of war, in which a discrete aggressor launches an attack that a discrete defender repels. Climate change is war in the normatively relevant sense, but it is war of a novel kind, one in which the aggression is diffuse, the causal chains are collective, and the defensive options are globally distributed. This is precisely why just war theory requires modification rather than abandonment. The normative structure is sound: there is unjust harm, there are identifiable responsible parties, and there are victims with legitimate defensive claims. What is unsound is the operational assumption that defensive action can be directed at a discrete aggressor without implicating other parties. The cooperative defense model I am proposing is not an alternative to the war diagnosis. It is a consequence of it. Once we accept that climate change is unjust aggression of a collective and diffuse kind, it follows that the defensive response must also be collective and coordinated, because no unilateral action can address a threat of this structure without imposing

²⁶⁴ I earlier discussed Steven Gardiner's objection to SSI as a “global public good.” The difference here, I hope, is that with the cooperative model I propose, most of the concerns presented by Gardiner are addressed.

harms on other victims. The modification to just cause proposed here is therefore not evidence that the war framing was wrong. It is evidence that the war framing, once accepted, demands a form of defense that the inherited individualist framework was not designed to accommodate.

Another form of support for, or another way of understanding, the concept of collective self-defense lies in the shift we have seen in protections for citizens in other states. In the past, there was an understanding that whatever happened behind someone else's borders was their concern and no one else's. This attitude can still be seen in Walzer's reluctance to endorse war on humanitarian grounds, restricting it to those cases that "shock the imagination."²⁶⁵ As we have developed as a more global community, there has been a greater willingness to wage war for the protections of the citizens of another state, protecting them from their own government. This shift can be seen as an evolution of our moral understanding regarding who and what we have a responsibility to protect. The evolution of the Responsibility to Protect (R2P) framework in international ethics marks the shift from an individualist to a cooperative notion of just cause.²⁶⁶ R2P is premised on the idea of sovereignty as responsibility rather than absolute right, committing states to protect populations from mass atrocity crimes regardless of borders.²⁶⁷ In practice, it created a legal and moral framework for collective action against genocide, war crimes, ethnic cleansing, and crimes against humanity. Notably, R2P broadens the traditional just war focus on national self-defense by affirming that when a state fails to shield its people, the international community shares a duty to intervene for the common good. This cooperative ethos directly informs a reconceived just cause: under R2P's logic, the justification for using force can rest not only on self-defense, but on defending others in grave peril—a clear departure from purely individualist models of just war.

The R2P principle illustrates how cooperative defense can be a moral imperative in the face of global threats, a lesson that fits nicely in our concept of collective self-defense. If the international community accepts an obligation to protect strangers from atrocity, it stands to reason that similar

²⁶⁵ Elaine Kamarck, "The Challenging Politics of Climate Change," Brookings Institution, September 23, 2019, <https://www.brookings.edu/articles/the-challenging-politics-of-climate-change/>; United Nations Framework Convention on Climate Change (UNFCCC), May 9, 1992, preamble, <https://unfccc.int/resource/docs/convkp/conveng.pdf>.

²⁶⁶ International Commission on Intervention and State Sovereignty (ICISS), *The Responsibility to Protect: Report of the International Commission on Intervention and State Sovereignty* (Ottawa: International Development Research Centre, 2001), 13-15.

²⁶⁷ United Nations General Assembly, *2005 World Summit Outcome*, Resolution 60/1, October 24, 2005, paras. 138-140.

obligations could apply to protecting vulnerable populations from climate-driven catastrophes. Indeed, some scholars argue that any crisis which “concerns the entire international community” and “cannot be solved by a single member” creates an international responsibility to protect, assist, and/or respond, a description that unequivocally includes climate change.²⁶⁸ By treating climate stability as a common concern of humankind, analogous to a humanitarian crisis, the R2P ethos opens the way to viewing collective environmental protection as a just cause. R2P’s legacy of shared moral responsibility thus reinforces the argument that just cause in the climate era must be grounded in cooperative defense, not merely in self-interested claims of national survival. This sets the stage for an updated just war paradigm oriented to a coordinated and collective understanding of self-defense against the harm of climate change.²⁶⁹

There remains the question of how this concept of a cooperative self-defense model would work. We can use the sample case of two island nations needing different forms of geoengineering. A cooperative defense model would require these states to coordinate their actions through international agreements or collaborative frameworks. Rather than each state pursuing its own defensive strategy independently, they would engage in a mutual defense strategy, where the goal is to ensure that both states survive without causing harm to each other. This could involve compromise, such as adjusting the timing or intensity of geoengineering efforts to avoid negative interactions, or it could involve more creative solutions, such as combining resources to implement a joint geoengineering project that benefits both nations. In the example from Chapter 3 about the two people trapped in adjacent wells and treading water, this cooperative defense model would require that they work together so that both could get out of the well.

While this may be a way to tweak just cause so that it no longer fails to account for justified, conflicting claims of self-defense, there are certainly some concerns. One issue is that it calls for cooperation, but what happens when cooperation is not possible. What I mean by this is that if one state (C) wishes to cooperate but the other state (R) refuses, then state C has settled just cause and the state is allowed to move forward since they did their due diligence. However, what if both states

²⁶⁸ Alexander J. Bellamy, *Responsibility to Protect: The Global Effort to End Mass Atrocities* (Cambridge: Polity Press, 2009), 27-30.

²⁶⁹ International Crisis Group, “The Responsibility to Protect in Environmental Emergencies,” Crisis Group Commentary, 2008, <https://www.crisisgroup.org/global/responsibility-protect-environmental-emergencies>; Linda A. Malone, “Green Helmets’: Eco-Intervention in the Twenty-First Century,” William & Mary Law School Faculty Publications, 2009, <https://scholarship.law.wm.edu/facpubs/1170/>.

are willing to cooperate with each other, but with no path forward that is satisfactory for both states? Here it is not C versus R, but instead C versus C, which is, in fact, the configuration the wells example in Chapter 3 was designed to illustrate.

This is the same sort of issue that is present with the just war requirement of last resort. In traditional warfare, the issue with last resort is that there is always something else that may be tried.²⁷⁰ There is one more negotiation, one more appeal for peace, one more charge of sanctions if an aggression occurs, and so on and so forth. The worry is that there is always one more thing to try until the bombs start falling. With the cooperation model of just cause, we have a similar sort of issue. How long do two states need to negotiate before one, or both, have satisfied the just cause requirement and are allowed to try to save themselves? The charge could always be that just cause was not met because they should have attempted one more negotiation, etc. However, like the requirement of last resort, there must be some stopping point at which a state is allowed to move forward with the defense of their state.²⁷¹

Returning to the example of the two people trapped in adjacent wells, how long are they required to try to work together before they are allowed to act in their own best interest? At what point are they allowed to ignore the needs of the other trapped person, treading water and close to drowning, and simply turn the valve and save themselves? Here there is an element of game theory, and game theory would tell us that each state would believe the correct strategic answer, with regard to saving one's life, is to be the first to turn the valve. But the question that drives the rest of this chapter is not the strategic one. It is the moral one: when is it morally permissible to turn the valve? Game theory cannot answer that question; it can only tell each state what is in its own interest, which is not the same thing. But the relevant answer we are looking for is when is it okay to turn the valve. We may chalk this up to the sort of thing that is (at least sometimes) unknowable to us, at least for now. It is one thing to say there is no correct answer, it is entirely different to say that we do not have proper epistemic access to the correct answer. There might be a correct answer in every case. There might be an exact moment for everyone when it is appropriate to shift back to an individualist model and abandon the cooperative model, having satisfied the moral requirements for cooperation.

²⁷⁰ Last resort was also discussed in Chapter 3. See Walzer, *Just and Unjust Wars*, at 80-82; McMahan, *Killing in War*, at 20-23; Gardiner, "The Desperation Argument for Geoengineering," at 28-33.

²⁷¹ James Pattison, "The Ethics of Diplomatic Criticism: The Responsibility to Protect, Just War Theory and Presumptive Last Resort," *European Journal of International Relations* 21, no. 4 (2015): 935-957, <https://doi.org/10.1177/1354066115572491>.

However, the more worrisome issue is that this simple (relatively speaking) model does not really account for the true complexity and likely impossibility of the task of cooperation.

Cooperation would certainly involve some sort of negotiation between the relevant states, and while we are using two states in our examples, that is likely too simplistic.²⁷² The reality is that with a global issue such as climate change and geoengineering, there would likely be dozens of states that would need to be part of the negotiations in order to truly satisfy just cause as we have reimagined it. The idea that having two states come to a decision might be difficult but would be exponentially more difficult in reality. Cooperation between the Maldives, Kiribati, Haiti, South Sudan, and a dozen other states would be near enough an impossibility that we can likely simply dismiss the possibility.²⁷³ That is not to say that these dozen states might not be able to sit down and negotiate, it is just a claim that with so many state actors, with such disparate needs, there would not be a solution that could satisfy every state. Which state would be willing to accept that they would be sacrificed so everyone else could live? What is more, it is not clear that there is any sort of moral requirement for such a sacrifice. Such a sacrifice would require the state to violate the duty that it owes to its own citizenry as discussed in the last chapter.

Another complicating aspect is that even when there is an agreement between a group of states, there would likely need to be some international body that oversaw the implementation of the agreed upon course of action. We currently do not have such a body, and if our existing international frameworks are adapted to this goal, there is the worry that they will once again be dominated by the climate aggressors and will undermine the justice of whatever course of action is chosen. For example, if a group of states developed a geoengineering implementation strategy, then if existing international organizations such as the UN were involved, then it is likely that the U.S. or other carbon heavy states might object or seek to modify the implantation for their own benefit.

The challenges in implementing a cooperative model for just cause highlight the need to reexamine proportionality. As we have seen, determining when a state may justifiably prioritize its own defense over the collective interest is fraught with ethical uncertainty. The requirement for cooperation introduces concerns about fairness and feasibility, especially when negotiations involve

²⁷² Beyond likely, it is certainly too simplistic.

²⁷³ As previously noted, the harms from climate change will disproportionately harm the global poor. See World Bank, “Climate Change Impacts on the Poor: Disproportionate Burdens,” accessed October 21, 2024, <https://www.worldbank.org/climatechange>.

numerous states with conflicting interests. This complexity becomes even more apparent when considering the scale of harm that defensive actions might inflict, not just on the initiating state or its direct adversary but on third parties and the global environment.

4. Repairing Proportionality

In Chapter 4, we explored the traditional and revisionist approaches to proportionality in just war theory, including McMahan's distinction between narrow and wide proportionality.²⁷⁴ Narrow proportionality focuses on the immediate effects of an action, assessing whether the harm inflicted on combatants is justified by the intended defensive outcomes. Wide proportionality expands this by considering the indirect harms that may befall non-combatants or the broader population, weighing these against the moral aims of the conflict. These frameworks, while effective for assessing localized conflicts, become insufficient when addressing global environmental threats like climate change and geoengineering. Here, the impacts of defensive actions ripple across borders, affecting states that are not directly involved in the initial decision-making process.

To address these issues, I propose expanding McMahan's framework to include a new category: global proportionality. This framework considers the cumulative global impact of defensive actions, assessing not only the potential harms and the degree of benefit each action produces for the global community. In a globalized world, where the actions of one state can significantly influence the survival of others, it is no longer enough to satisfy proportionality by avoiding unnecessary harm. States must also consider how their actions—especially in climate-related geoengineering—can increase the benefits for other states, even if this means accepting a less optimal outcome for their own interests.

In addition, Walzer's distinction between a violation of proportionality and proportionality shifting to responsibility becomes crucial in this context.²⁷⁵ When a state faces no other viable course of action, the ethical burden may shift from strictly maintaining proportionality to assuming responsibility for the consequences. This allows for defensive actions that may impose disproportionate harm, provided that the state recognizes its obligation to minimize that harm and work toward restoring balance. Walzer's insight is especially relevant when considering global

²⁷⁴ See Chapter 4, also: McMahan, *Killing in War*, at 21-23.

²⁷⁵ Walzer, "Responsibility and Proportionality," at 40-52.

proportionality, where states must weigh their immediate defensive needs and their responsibility to the global community when ideal solutions are no longer available.

When exploring McMahan’s views on proportionality, I argued that some of the conclusions drawn from revisionist perspectives are misguided because they rely on individualistic reasoning that does not apply well to proportionality. One example I used, which I argued offered a more accurate analogy, was that of a corporation.²⁷⁶ If we consider again the ways in which corporations operate and the obligations they have to shareholders, we can see a potential refinement of proportionality—a third category beyond narrow and wide. I criticized the notion that a corporation could bankrupt itself to save another corporation, suggesting instead that a competition model for corporations maps more accurately onto the relationships between states. However, there are certain actions that corporations are not allowed to take, and there are times when the government steps in to prevent corporations from expanding or saving themselves in a way that would harm others.

There are instances where the government intervenes and essentially takes control of certain companies, particularly when their collapse could damage the entire national economy. Similarly, when a corporation grows to the point where it stifles competition and threatens consumer welfare, the government may force it to cease operations or split it apart. The breakup of AT&T and the “Baby Bells” in 1982, or the dissolution of Standard Oil in the early 20th century, are prime examples of this kind of intervention.²⁷⁷ Despite our capitalistic system, there are times when the typical obligations and expectations of corporate behavior are overridden because of the risks posed to the entire industry or the broader country. Using this as an analogy, the restrictions imposed by governments on corporations that threaten national economic health are akin to the kind of restrictions that global proportionality would place on states engaging in actions that threaten the global community.

Global proportionality would require that a state engaged in geoengineering, or any other activity with global implications, move beyond a narrow consideration of harm. It would necessitate a global calculation, assessing the harm to individual states alongside the cumulative global harm or

²⁷⁶ See Chapter 4.

²⁷⁷ See “The Breakup of the Bell System,” Federal Judicial Center, accessed October 27, 2024, <https://www.fjc.gov/history/spotlight-judicial-history/breakup-ma-bell>; Library of Congress, “Standard Oil’s Monopoly: Topics in Chronicling America,” *Research Guides*, accessed May 27, 2025, <https://guides.loc.gov/chronicling-america-standard-oil-monopoly>.

benefit. This is where Walzer's shift from proportionality to responsibility comes into play. Even if a particular form of geoengineering would be optimal for one state, global proportionality might require that the state choose a less favorable option to reduce the broader harm to other states. Once global proportionality is considered, there may still be situations where innocent states are harmed. In such cases, proportionality shifts to responsibility, meaning the state suffering from harm due to the geoengineering would be owed restitution or amends. This responsibility could fall on the state performing the geoengineering, or it might fall on those most responsible for the underlying climate change—such as the United States and other historically high-emitting states.

To further illustrate the application of global proportionality and the shift from proportionality to responsibility, consider a hypothetical case involving two island nations, State A and State B, both facing imminent threats from rising sea levels due to climate change. State A, a relatively wealthy nation, has the capability to implement stratospheric sulfate injection (SSI) to lower global temperatures and slow the rise of sea levels, thereby protecting its territory. However, the deployment of SSI would have unintended side effects on regional weather patterns, potentially reducing rainfall in State B, which is highly dependent on consistent precipitation for its agricultural economy. State B, a smaller and less economically powerful nation, lacks the resources to counteract the adverse effects of SSI and would suffer severe food shortages if rainfall is disrupted.

In this scenario, both narrow and wide proportionality might justify State A's actions, as it is attempting to protect itself from an existential threat in a way that is, from its perspective, proportional to the danger it faces. However, global proportionality requires that State A take a broader view, considering not only its own needs but the cumulative harm its actions would cause to the global community, particularly to innocent states like State B. Under global proportionality, State A would be ethically obligated to explore alternatives that would minimize harm to State B, even if these alternatives are less effective or more costly. For instance, State A might choose to delay or modify the scope of its SSI deployment to lessen its impact on rainfall in the region, or it might collaborate with international bodies to develop a joint geoengineering strategy that addresses both states' concerns.

If, after exhausting all cooperative avenues, State A proceeds with SSI and harms State B's agriculture, Walzer's shift from proportionality to responsibility would apply. In this case, even though State A acted within its rights to protect itself, the responsibility for unintended harm to State

B would shift to State A. State A would then be morally obligated to provide restitution or assistance to mitigate the damage done to State B, whether by providing economic aid or supporting technological adaptations to help State B withstand the agricultural impacts of the SSI. This case illustrates how global proportionality and responsibility frameworks ensure that the self-defense actions of one state are balanced by an obligation to address the broader consequences for other states, promoting a more just and cooperative international order.

This scenario is fairly strait forward, but the more difficult issue is when two states are relatively equal in wealth and in level of threat from climate change. So, if we reimagine that State A and State B are both poor, small island nations facing the same existential threat from rising sea levels caused by climate change. State A decides to implement SSI as its only available means to lower global temperatures and slow the rise of sea levels, but this intervention could have devastating side effects on State B's rainfall, threatening its food security (or fisheries, etc.). Neither state has the resources to mitigate the global impact of geoengineering or develop alternative solutions on their own. However, due to their economic limitations and lack of technological infrastructure, they both face imminent destruction without intervention.

From the perspective of global proportionality, even though State A is justified in seeking to defend itself through geoengineering, the broader consequences for State B must be taken into account. Both states lack the capacity to fully explore alternatives, negotiate mitigation strategies, or bear the burden of responsibility for global climate impacts. In such cases, the responsibility for mitigating harm—and compensating for any negative consequences—would logically fall on the wealthier, high-emitting nations that bear the greatest responsibility for contributing to climate change in the first place.

Under Walzer's framework, the shift from proportionality to responsibility here would mean that while State A's actions are proportionate given its limited options, the responsibility for global harms caused by its geoengineering actions does not rest solely with either State A or State B. Instead, it would fall on richer, high-polluting countries—those historically responsible for climate change and equipped with the resources to provide compensation or support. For instance, nations like the United States, China, and European countries, which have contributed significantly to global emissions, would be responsible for ensuring that poorer nations like State A and State B do not disproportionately suffer the effects of geoengineering or climate change itself. This aligns with the

polluter pays principle widely endorsed in the climate ethics literature, which holds that those who have caused the most environmental harm bear the greatest obligations to address its consequences and to prevent further injustice. As Henry Shue and Simon Caney have argued, assigning such responsibilities to affluent, high-emitting states reflects both fairness in burden sharing and the moral imperative to rectify past wrongdoing.²⁷⁸

These wealthier nations could be expected to assist with funding or technological support to reduce the harm caused by SSL, ensuring that both State A and State B can survive without bearing the full brunt of geoengineering's consequences. This would likely take the form of restitution payments, technological transfers, or cooperative development of geoengineering technologies that do not disproportionately harm vulnerable states. This scenario illustrates how global proportionality and responsibility can shift from poorer, at-risk nations to the historically wealthier polluters who have the resources and moral obligation to mitigate the consequences of climate change and the defensive actions taken by smaller, poorer states. By taking into account State A and State B are required to cooperate and coordinate, the global proportionality requirement to satisfy just war constraints would be satisfied so long as each state took the other into account. This may not practically happen, but there should be a correct answer to satisfy just war constraints—in so much as there are ever correct answers, or knowable answers, when dealing with war and related issues.

In considering objections to the framework of global proportionality, the first challenge is the claim that such a framework is infeasible because it is unknowable in practice and likely to be ignored by states. Critics may argue that it is impossible to accurately calculate the global impacts of an action like geoengineering on all affected states, and thus global proportionality cannot serve as a practical guide for decision-making. Furthermore, even if it were possible to know the global consequences, states are unlikely to prioritize global interests over their own, making this framework effectively irrelevant in real-world applications.

To this, my first response is that just war theory already contains elements that are often unknowable or difficult to fully calculate. For instance, proportionality itself (as traditionally understood) is frequently hard to assess with certainty, as the full consequences of a military action may not be entirely clear before it is undertaken. Similarly, considerations of necessity or right

²⁷⁸ See Shue, "Global Environment and International Inequality"; Caney, "Cosmopolitan Justice, Responsibility, and Global Climate Change"; Gardiner, *A Perfect Moral Storm*.

intention can be difficult to determine definitively in complex conflicts. Yet, the fact that these criteria are sometimes unknowable does not render them irrelevant. They remain essential guiding principles that shape ethical decision-making, even if they are difficult to perfectly implement in practice. The same can be said for global proportionality—while it may be challenging to fully grasp all potential global harms and benefits, this does not undermine its importance as a moral framework.

A second response to the infeasibility objection is that practical difficulty or the likelihood of being ignored does not invalidate a framework's correctness.²⁷⁹ Just because some states may fail to implement global proportionality does not mean it is not the appropriate metric for evaluating actions. Ethical theories often provide ideal standards that guide behavior, even if they are not always perfectly followed. The existence of laws or moral norms in any society relies on the understanding that not everyone will comply, yet this does not diminish the value of those norms. Global proportionality, in this sense, offers the correct ethical framework to address the complexities of global geoengineering, regardless of the likelihood of it being ignored or poorly executed by some states.

A second objection is that global proportionality is merely wide proportionality by another name, and thus the same objections to wide proportionality discussed in Chapter 4 apply here. This critique would argue that my proposal does not introduce a fundamentally new category and that any supposed innovations are merely superficial rebranding.

I reject this characterization. While wide proportionality considers the indirect harms to non-combatants or broader populations, global proportionality goes further by expanding the ethical consideration to the entire international community and requiring states to factor in the cumulative global impact of their actions. The key difference lies in the positive dimension of benefit maximization in global proportionality, which goes beyond avoiding harm to require states to actively seek actions that benefit other states. Wide proportionality lacks this explicit requirement, focusing only on limiting harm, whereas global proportionality requires states to pursue actions that enhance global welfare, even if that means accepting suboptimal outcomes for themselves. This is not a trivial

²⁷⁹ Jeff McMahan, "Feasibility Constraints in Just War Theory," in *Just War Theory and the Ethics of War*, ed. Helen Frowe and Gerald Lang (Oxford: Oxford University Press, 2014), 21–38.

difference but a substantial shift in how proportionality is applied in the context of global threats like climate change.

Moreover, objections to wide proportionality generally revolve around its complexity and the challenge of calculating indirect harm. These critiques, while valid in some contexts, do not fully address the moral urgency of global proportionality in cases where the survival of multiple states is at stake. The global nature of climate threats makes a broader framework like global proportionality not just necessary but ethically imperative. The failure to adopt such a framework would leave gaps in how we assess responsibility and harm in situations where defensive actions have far-reaching, global consequences. Even if a defensive use of SSI satisfied global proportionality, it would still generate what Walzer calls a moral remainder—the lingering duty to address the collateral harms suffered by climate-innocent populations. These harms are not erased by the justice of the cause; they create remedial obligations of compensation and reconstruction analogous to *jus post bellum* duties in traditional warfare. In practice, this means that any state or coalition implementing geoengineering must treat reparative measures—financial, infrastructural, or humanitarian—not as optional acts of generosity but as integral components of justified defense. Framing remedial duties in this way aligns JWT with global-justice insights and underscores that legitimate climate intervention carries an enduring responsibility to repair what it unavoidably damages.

In addressing both just cause and proportionality within the context of global crises like climate change, it has become clear that cooperation between states is essential to satisfying the ethical demands of just war theory. Whether through coordinating defensive actions to maximize global benefits or accepting responsibility for the harms imposed on others, the solutions I have proposed require states to look beyond their own immediate interests and act with the global community in mind. However, this cooperative model stands in stark contrast to the concept of robust sovereignty that I defended in Chapter 4, where the state's right to act independently, without external interference, was paramount. By demanding cooperation and shared responsibility, global proportionality challenges this traditional view of sovereignty, suggesting that in an interconnected world, sovereignty may no longer be absolute.

This tension raises an important question: If the solutions to just cause and proportionality require states to cooperate and compromise their independent decision-making, what does this mean for sovereignty itself? Perhaps it is time to reimagine sovereignty—not as an inviolable right to

act unilaterally, but as something that must adapt to the global responsibilities and interdependencies that define the modern era. These remedial and distributive dimensions point naturally toward questions of governance and legitimacy: if geoengineering is ever to be morally permissible, there must be institutions capable of authorizing, monitoring, and enforcing these obligations. In short, adopting these cooperative fixes to just cause and proportionality means states can no longer behave as entirely independent agents. This raises a deeper question: if defending against climate change demands coordination and shared authority, what must change about our concept of sovereignty? In the next section, I will explore what sovereignty might look like in a world where states are ethically obligated to cooperate for the global good, and how this reimagined concept can reconcile the demands of justice with the realities of international relations.

5. Sovereignty Reimagined

The proposal to reimagine sovereignty in the context of climate governance may appear to contradict the argument I developed in the previous chapter, where I defended a strong view of state sovereignty against revisionist accounts that would subordinate state obligations to individualist moral reasoning. In that chapter, I argued that states owe their citizens an obligation that outweighs obligations to the citizens of other states, and that this obligation is grounded in the unique role the state plays as the guarantor of its members' security and self-governance. It would be inconsistent to defend that strong sovereignty claim in one chapter and then propose dissolving sovereignty into a supranational authority in the next. But that is not what I am proposing.

The argument in the previous chapter was that the state's strong obligations to its own citizens give it moral standing to act in their defense, even when doing so imposes costs on others, subject to proportionality constraints. That argument depended on a specific empirical premise: that there is no higher authority to which the state can appeal when threatened. As I noted there, the reason states possess the extraordinary moral permissions associated with sovereignty, permissions that individuals and sub-state organizations do not possess, is that the international system is anarchic in the Hobbesian sense. There is no sovereign above the sovereign. But this observation was descriptive, not normative. The fact that states currently exist in an anarchic system does not mean that they should, or that the anarchic structure is adequate to address every kind of threat. The argument I am making here is that climate change and geoengineering represent a category of threat for which the anarchic system is structurally inadequate, precisely because any available defensive response operates on a shared global commons and therefore necessarily implicates the vital interests of other

states. In such cases, the strong sovereignty claim from the previous chapter actually supports the need for a higher authority rather than contradicting it. If states have powerful obligations to protect their citizens, and if unilateral defensive action in the climate context risks destroying the conditions under which other states can fulfill that same obligation, then the strong sovereignty claim generates a collective action problem that only a coordinating authority can resolve. The proposal is not to weaken sovereignty but to create the institutional conditions under which multiple states can fulfill their sovereign obligations simultaneously, rather than being forced into a competitive self-defense that may destroy them all.

To put the point differently: the previous chapter argued that the state cannot sacrifice its citizens' interests for the sake of another state. This chapter argues that uncoordinated unilateral action in the climate context risks precisely that outcome for everyone. A supranational authority limited to climate governance is not a replacement for state sovereignty. It is the mechanism by which sovereign states avoid a situation in which exercising their sovereign rights destroys the conditions under which sovereignty is meaningful.

First, consider that there is no sacrosanct or moral underpinning that anchors sovereignty to state level governance. There was a time when meaningful governance for humanity was bound to small groups, villages, tribes, etc. At these times, the right to remain a member of the village or tribe or other small group, meant following the rules of the group, or of the leader of the group. While it was certainly the case that many times the rules—and rulers—were unjust or came to power in a manner that was unjust (just like modern times), and sovereignty was not a concept that was fully developed nor applied, the same sort of moral underpinning was present. What is more, this sort of small group dynamic was present and the dominate form of governance for far more of human history than anything like the governments we now have.²⁸⁰

This being the case, there should be some willingness to accept that we have reached a point in human history when sovereignty needs to move beyond the state and be controlled—at least in some instances—on a global level instead. This is not to say that there is some dramatic shift in governance and sovereignty. In much the same way that there are various levels of the social contract to which we belong, here in the United States we have often have municipal governance (if we live

²⁸⁰ Max Borders, “The Evolution of Governance in 9 Stages,” *Foundation for Economic Education*, September 21, 2019, <https://fee.org/articles/the-evolution-of-governance-in-9-stages>.

in an urban area), followed by county governance, then state, and finally federal governance. In the sort of case we are exploring here, we would simply be adding a level of governance to which the federal government would defer. For most issues, the federal level—or what is equivalent to the federal level here in the U.S.—would still hold the same authority and have the same obligations as our current understanding of sovereignty. The problem here is to understand what sort of governance, or what sort of structure, is appropriate for governing in the global cases.

This discussion is certainly something that could snowball out of control, so I propose that the only sort of governance, or more accurately stated, the only issue that needs the next level of governance beyond individual countries, is that of climate change and related issues, such as geoengineering.²⁸¹ This view aligns with the broader evolution of governance over time, adapting to meet the complex challenges of an interconnected world. As climate change and geoengineering present increasingly global threats, they necessitate a reconsideration of sovereignty that includes a level of global governance capable of addressing these issues effectively.

The development of international environmental governance since the Stockholm Conference of 1972 reflects an evolving understanding of sovereignty that incorporates global responsibility.²⁸² The Stockholm Declaration laid the foundation for recognizing the environment as a global commons and established principles for states to manage natural resources without causing harm to other states. This was further reinforced by subsequent agreements, such as the Rio Declaration (1992), the Kyoto Protocol (1997), and the Paris Agreement (2015), which emphasized both individual state commitments and collective responsibility to mitigate climate change.²⁸³ However, these frameworks often lack enforcement mechanisms, illustrating the limitations of relying solely on state sovereignty to manage global risks. The Paris Agreement, for example,

²⁸¹ At least at this time. The arrival of ET would be another notable time when governance needs to move to another (global) level beyond the state level.

²⁸² United Nations Conference on the Human Environment, *Stockholm Declaration*, UN Doc. A/CONF.48/14/Rev.1, June 16, 1972, accessed October 27, 2024, <https://www.un.org/en/conferences/environment/stockholm1972>.

²⁸³ United Nations Conference on Environment and Development, Rio Declaration on Environment and Development, UN Doc. A/CONF.151/26 (Vol. I), June 14, 1992, accessed October 27, 2024, <https://digitallibrary.un.org/record/160453>; Kyoto Protocol to the United Nations Framework Convention on Climate Change, December 11, 1997, UN Doc. FCCC/CP/1997/L.7/Add.1, entered into force February 16, 2005, accessed October 27, 2024, https://unfccc.int/kyoto_protocol; Paris Agreement, December 12, 2015, UN Doc. FCCC/CP/2015/L.9/Rev.1, entered into force November 4, 2016, accessed October 27, 2024, <https://unfccc.int/process-and-meetings/the-paris-agreement>.

operates on voluntary commitments rather than binding enforcement, leading to varying levels of compliance and effectiveness. This gap is particularly concerning when considering geoengineering technologies, whose potential deployment could have immediate and significant transboundary effects, such as altered weather patterns or unintended ecological impacts.

Ethical considerations in geoengineering governance have a longer lineage than the most-cited frameworks suggest. The earliest substantive set of conditions belongs to Dale Jamieson, who in 1996 argued that any intentional climate intervention must satisfy four requirements to be morally permissible: it must be technically feasible, its consequences must be reliably predictable, it must produce outcomes socially and economically preferable to the alternatives, and it must not seriously violate important ethical considerations, chief among them democratic decision-making, the prohibition of irreversible changes, and learning to live with nature rather than dominating it.²⁸⁴ Jamieson's conditions predate the Oxford Principles by more than a decade and frame much of the subsequent debate. The Oxford Principles (2009) extended this trajectory, advocating for transparency, public engagement, and treating geoengineering as a public good.²⁸⁵ They also emphasized the need for independent assessment of impacts and governance frameworks before deployment, seeking to ensure that geoengineering research and implementation would be guided by ethical principles that respect both global welfare and state sovereignty. Building on both Jamieson's earlier work and the Oxford Principles, the Tollgate Principles (2018) advanced ethical discourse by emphasizing justice and global equity.²⁸⁶ Co-developed by scholars like Stephen Gardiner and Augustin Fragnière, the Tollgate Principles call for more robust governance that includes mechanisms for accountability and liability. They argue that any geoengineering governance framework must address ethical concerns about fairness, transparency, and the prevention of harm to vulnerable populations, particularly in the Global South.

These principles reflect a growing consensus that geoengineering cannot be governed solely by national interests, or the existing international legal frameworks designed for less disruptive technologies. Instead, they advocate for a stronger, more centralized international governance

²⁸⁴ Dale Jamieson, "Ethics and Intentional Climate Change," *Climatic Change* 33, no. 3 (1996): 323–36, at 326–32.

²⁸⁵ Steve Rayner, Clare Heyward, Tim Kruger, Nick Pidgeon, Catherine Redgwell, and Julian Savulescu, "The Oxford Principles," *Climatic Change* 121, no. 3 (2013): 499–512.

²⁸⁶ Stephen M. Gardiner and Augustin Fragnière, "The Tollgate Principles for the Governance of Geoengineering: Moving Beyond the Oxford Principles to an Ethically More Robust Approach," *Ethics, Policy & Environment* 21, no. 2 (2018): 143–174.

structure that has the authority to enforce ethical norms, mediate disputes, and require compensation for any harm caused by geoengineering interventions. This evolving ethical framework suggests a reimagined form of sovereignty, one that emphasizes shared responsibility over unilateral control.

As previously discussed, the limitations of just war theory in addressing climate change and geoengineering are evident. The theory struggles to adjudicate between conflicting claims of self-defense, particularly when states attempt to use geoengineering as a defensive measure against climate impacts. In such cases, the principles of just war, including proportionality and legitimate authority, can be interpreted in conflicting ways, leading to potential moral impasses.

The ethical principles underpinning both the Oxford and Tollgate frameworks suggest that a more authoritative international governance structure is necessary to manage geoengineering fairly and effectively. This aligns with my broader argument that international governance, particularly in the context of climate change, must have the power not only to set guidelines but also to enforce compliance, impose penalties, and require reparations for harm. Without such authority, the global community risks unilateral actions by states that could lead to unintended and potentially irreversible consequences, similar to the challenges presented by nuclear weapons but without the clear international governance structures developed to manage their use.

The need for a stronger international stance is further supported by the ethical limitations of just war theory when applied to global issues like climate change. As argued in earlier chapters, the theory's inability to resolve conflicting self-defense claims or to adequately address the disproportionate effects of climate change on vulnerable populations reveals its shortcomings. In this context, the idea of an empowered international body with enforcement capabilities becomes not just desirable but necessary. Such a body could ensure that geoengineering deployment adheres to agreed-upon ethical principles, prevent rogue actions by individual states, and establish clear liability mechanisms for unintended harm. For instance, if stratospheric sulfate injection (SSI) were to be deployed by one state, the resulting impacts on global weather patterns could prompt claims of environmental harm from other nations. An authoritative international body could mediate these disputes and require compensation for affected parties. This approach would ensure that the principles of proportionality and accountability are not merely theoretical but are enforceable at an international level, addressing both ethical and practical concerns related to geoengineering governance.

While I advocate for the necessity of global governance in addressing the challenges posed by climate change and geoengineering, I acknowledge that this framework is not without its worries. Concerns regarding the global poor are notably articulated by Marion Hourdequin, who highlights the potential for geoengineering interventions to exacerbate existing inequalities.²⁸⁷ Additionally, Patrick Taylor Smith discusses issues of dominance among powerful nations, emphasizing how such dynamics can undermine equitable governance.²⁸⁸ These ethical dilemmas are essential to consider, as any proposed global governance model must rigorously account for potential injustices to ensure that the voices of marginalized communities are heard and prioritized in decision-making processes.

Even while considering these worries, reimagining sovereignty in the context of geoengineering and climate change governance requires a shift from traditional, state-centered models to a more cooperative and enforceable international framework. The evolution of environmental regulations from Stockholm to the Paris Agreement reflects progress, but the challenges posed by geoengineering demand further innovation. The Oxford and Tollgate Principles provide a foundation for this reimagined sovereignty, emphasizing the need for shared responsibility, transparency, and accountability. However, to fully address the ethical and practical challenges of geoengineering, international governance must evolve beyond voluntary compliance to include mechanisms for enforcement and liability. Given the limitations of just war theory, this approach may offer the only viable path forward in ensuring global justice and sustainable climate solutions.

6. Conclusion

This chapter aims to reconcile just war theory with the novel challenges posed by global threats like climate change and geoengineering. Just as the theory evolved to address changes in warfare—from Augustine's foundational views to the modern refinements of Walzer and McMahan—it must now adapt to a new set of realities. These realities, however, extend beyond traditional conflicts and introduce ethical and practical questions that cannot be adequately addressed by existing principles. In the context of climate change, the diffuse and interconnected nature of threats, coupled with the potential for geoengineering to cause global harm, exposes gaps in the theory that require both reinterpretation and expansion.

²⁸⁷ Hourdequin, “Climate Change, Climate Engineering, and the ‘Global Poor.’”

²⁸⁸ Smith, “Legitimacy and Non-Domination.”

The exploration of just cause in this chapter has focused on moving from an individualistic to a cooperative defense model. This shift is necessitated by the inherent interconnectedness of global climate threats, where unilateral actions can produce unintended, transboundary effects. While traditional interpretations of self-defense emphasize the right of a state to protect its own citizens, they do not adequately account for the ethical obligations states have toward others facing the same existential risks. Thus, a cooperative model of self-defense—one that recognizes shared responsibility and the need for coordinated action—emerges as a necessary modification of just cause in an era defined by collective vulnerabilities.

However, as outlined, this cooperative model introduces practical challenges, such as the difficulty of determining when enough has been done to cooperate before a state can act independently. This is reminiscent of the traditional problem of last resort in just war theory, where a clear stopping point is elusive. The complexities of cooperation, especially when multiple states are involved, also raise concerns about fairness and feasibility. Yet, these challenges do not negate the ethical necessity of cooperative defense in addressing global threats like climate change. Instead, they make plain the urgency of developing clearer guidelines and mechanisms to facilitate coordinated action.

The adaptation of proportionality to global threats requires a similar expansion. The introduction of global proportionality offers a more comprehensive approach by demanding that states consider the cumulative global impact of their defensive actions. This reimagined proportionality not only limits harm but also actively seeks to maximize global welfare. By incorporating Walzer's concept of shifting from proportionality to responsibility, this framework ensures that states are held accountable for unintended consequences, even when their actions are necessary for self-defense. The inclusion of this broader perspective aligns with the ethical imperative to prevent harm on a global scale, even when pursuing just causes.

These modifications to just war theory inevitably lead to a reconsideration of sovereignty itself. In previous chapters, I defended a strong conception of sovereignty, emphasizing the state's authority and obligations to its citizens. However, as this chapter argues, global challenges like climate change necessitate a shift toward a form of sovereignty that is both shared and accountable to the global community. This reimagined sovereignty, while retaining elements of traditional authority,

must allow for international governance mechanisms capable of enforcing ethical norms and mediating disputes related to global threats.

The ethical frameworks established by the Oxford Principles and the Tollgate Principles provide a foundation for this reimagined sovereignty, advocating for transparency, accountability, and enforceable governance. These principles reflect a growing consensus that geoengineering cannot be effectively governed within existing national frameworks. Instead, they emphasize the need for stronger international institutions that have the authority to enforce compliance, impose penalties, and require compensation for unintended harm. Without such enforceable governance, the risks of unilateral action and potential global harm remain significant.

In this context, the limitations of just war theory become apparent. While the theory can be adapted to address elements of global threats, it remains insufficient as a standalone framework. The ethical demands of climate change and geoengineering call for a more robust system of international governance, one with the power not just to set guidelines but to enforce them. This stronger stance on international governance is necessary, not merely desirable, if we want ethical outcomes in a world defined by interdependence.

As with previous evolutions of just war theory, the current challenges require both philosophical adaptation and practical implementation. The proposed modifications to just cause, proportionality, and sovereignty offer a framework for confronting global threats, but they also point to areas that demand further research. Future inquiry must focus on the feasibility of cooperative defense, the mechanisms for implementing global proportionality, and the development of enforceable governance structures. Only through continued adaptation and stronger international cooperation can we hope to achieve ethical solutions to the pressing global issues of climate change and geoengineering.

Chapter 6: Looking Forward on Climate and War

1. Summary of Dissertation

In this dissertation I have argued that anthropogenic climate change should be understood not merely as a policy failure or an environmental tragedy, but as a form of unjust aggression, or at least as morally analogous to war in the respects that matter for normative evaluation.²⁸⁹ This claim is the foundation on which the rest of the project rests, and it was developed across the first two chapters.

Chapter 1 established the groundwork by examining the empirical severity of climate change, the particular vulnerability of low-lying and impoverished states, and the emerging literature that frames geoengineering as a form of national self-defense. The chapter surveyed several self-defense frameworks—liability views, lesser-evil justifications, agent-relative prerogative views, and autonomy-based accounts—and argued that the climate case falls within the domain of self-defense across these frameworks. The chapter also addressed the most natural objection to the self-defense framing, that self-defense presupposes an aggressor and climate change has none, and argued that what does the moral work is not hostile intent but responsibility for a foreseeable, avoidable, and sovereignty-threatening process.

Chapter 2 developed the central claim that climate change constitutes unjust war. Drawing on the argument offered by Kyle Fruh and Marcus Hedahl, I showed how the possibility of justified unilateral geoengineering implies that climate change itself must possess the normative structure of aggression. If a low-lying state may defend itself by violating the sovereignty of other states through atmospheric manipulation, then the underlying harm to which it responds must be of the sort that generates just cause for defensive action. I strengthened this argument with empirical evidence, legal and historical precedents, and responses to a series of objections, including the lack of a clear aggressor, the absence of traditional violence, and the absence of a singular inciting moment. I also addressed Rita Floyd's argument that Just Securitization Theory, rather than just war theory, is the

²⁸⁹ I reference several of the sources from earlier in the dissertation throughout the chapter. It seemed odd to include citation given the way they are discussed and the familiarity of the sources at this point, so citation is not provided for those sources. Direct quotes, new sources, or unfamiliar sources are all cited.

proper framework for evaluating climate responses, and argued that while Floyd's diagnosis of the problem is correct, her remedy is not: the right response is to extend JWT rather than replace it.

Chapter 3 turned to the challenge that the war diagnosis creates for just war theory itself: the problem of conflicting claims of self-defense. If multiple victim states each have just cause to deploy geoengineering, but their deployments are mutually destructive, then just war theory appears unable to guide action. I explored this problem from both traditionalist and revisionist perspectives, and showed that the three standard accounts of self-defense justification—the culpability account, the causal account, and the responsibility account—all fail to resolve the conflict. The chapter concluded that the problem is not that just war theory gives an answer we dislike, but that it lacks the resources to give any answer at all in this novel scenario.

Chapter 4 examined proportionality, the second major site of breakdown. I argued that both narrow and wide proportionality, as currently understood, either prohibit SSI entirely or fail to provide meaningful constraints on its use. The traditionalist approach, represented by Michael Walzer, allows for greater flexibility in extreme situations but struggles with the globally distributed harms of atmospheric intervention. The revisionist approach, represented by Jeff McMahan, imposes strict individualist constraints that are inappropriate for state-level decision-making in an anarchic international system. The chapter also argued that the analogy between individual self-defense and state-level defense is fundamentally misleading, and that state obligations are better understood through analogies of stewardship and fiduciary duty.

Chapter 5 proposed modifications to just war theory designed to address the failures identified in the preceding chapters. I argued for a cooperative model of just cause that replaces the individualist assumption with a shared obligation to coordinate defensive action. I proposed a third tier of proportionality—global proportionality—that requires states to assess the cumulative global impact of their defensive actions rather than only the impact on their own populations. And I argued that traditional notions of sovereignty must be reimagined to accommodate a limited form of supranational governance over climate-related decisions, not as a replacement for state sovereignty but as a necessary institutional condition under which multiple sovereign states can fulfill their obligations simultaneously.

2. Implications

The framework developed in this dissertation is not merely an exercise in applied ethics. If the arguments I have advanced are correct, they carry implications for how we think about several ongoing debates in climate ethics, geoengineering governance, and the just war tradition itself. In this section, I draw out those implications, not as promissory notes for future research but as consequences of the arguments already given.

The most immediate implication concerns the moral standing of vulnerable states in geoengineering debates. The current discourse around solar geoengineering tends to treat it as a global policy question to be decided by international consensus, with the assumption that no state should act unilaterally. There are good reasons for this assumption, and I have endorsed many of them in earlier chapters. However, the framework developed here shows that the moral landscape is more complicated than a simple prohibition on unilateral action would suggest. If climate change constitutes unjust aggression, and if vulnerable states hold defensive rights grounded in just war theory, then those states possess a moral standing that is not captured by the language of global governance alone. They are not merely stakeholders in a policy debate. They are victims of an ongoing wrong who hold, at minimum, a defeasible right to act in their own defense. This does not mean that unilateral geoengineering is permissible in all or even most cases. The constraints of cooperative defense, global proportionality, and the need for supranational coordination all militate against unilateral action under ordinary circumstances. But it does mean that the moral baseline is different from what much of the governance literature assumes. A state facing the total loss of its territory and sovereignty is not in the same moral position as a state debating the optimal level of carbon taxation. The former has a defensive claim that the latter does not, and any governance framework that treats them as equivalent has missed something morally important. That is not to say that I believe that those poorer states will not be completely ignored anyway.

A second implication concerns the classification of states in relation to climate responsibility. In Chapter 1, I introduced three categories of states, applied in Chapter 3 to the *jus ad bellum* analysis: states that clearly fail to meet *jus ad bellum* requirements due to their high emissions and available alternatives, gray-area states that are both significant emitters and serious victims, and climate-victim states with minimal emissions and maximum exposure. This tripartite classification, while rough, has practical consequences for how we think about geoengineering governance. Under

the cooperative defense model, states in the first category—the United States, Australia, China, and similar high emitters—cannot invoke self-defense to justify unilateral geoengineering. Their primary obligation is mitigation, not atmospheric intervention. States in the third category—Kiribati, Tuvalu, the Maldives, and similar low-lying nations—have the strongest defensive claims, but those claims are constrained by the requirements of cooperation and global proportionality. The most difficult cases are the gray-area states, like India, which are simultaneously major emitters and home to hundreds of millions of people severely threatened by climate impacts. The framework developed here does not resolve these cases cleanly, and I do not think any framework can. But it does provide a structure within which the relevant moral considerations can be identified and weighed: the severity of the threat, the degree of responsibility for the underlying harm, the availability of alternative measures, and the global distributional effects of the proposed defensive action.

A third implication concerns the just war tradition itself. This dissertation has argued that climate change destabilizes several core assumptions of just war theory: that aggression involves a discrete agent with hostile intent, that defensive action can be directed at the source of the threat without necessarily implicating other victims, and that proportionality can be assessed by examining the relationship between a specific military action and its specific consequences. These are not minor adjustments. They represent a challenge to the operational architecture of the tradition, even if the underlying moral principles—that unjust harm generates defensive rights, that defensive action must be proportionate, that innocent parties deserve protection—remain sound. The modifications I have proposed—cooperative defense, global proportionality, and reimagined sovereignty—are offered as extensions of the tradition rather than replacements for it. But I want to be candid about the scope of what is being proposed. If these modifications are accepted, just war theory after climate change will look significantly different from just war theory before it. The tradition will have expanded its domain to encompass diffuse, structural, and intergenerational forms of aggression. It will have incorporated a cooperative dimension that sits uneasily alongside its historically individualist orientation. And it will have acknowledged that some threats require institutional solutions that go beyond what any single state can provide through unilateral defensive action. Whether this represents a healthy evolution or an overextension of the framework is a question I leave open. My own view, for what it is worth, is that a tradition that cannot adapt to the most serious sovereignty-threatening process in modern history has already failed, and that adaptation, even when it strains the inherited framework, is preferable to irrelevance.

There is also an implication for how we think about the relationship between just war theory and climate justice. Throughout this project, I have focused on JWT as the primary normative framework, while acknowledging that the climate justice literature, particularly the work of Henry Shue, Thomas Pogge, and Simon Caney, addresses questions of responsibility and burden-sharing that JWT alone cannot resolve. The framework developed here suggests that these two bodies of literature are more closely related than is often recognized. The cooperative defense model I have proposed requires attention to background inequities in wealth, historical responsibility, and vulnerability. Global proportionality requires an assessment of distributional effects that cannot be conducted without reference to justice-based considerations. And the reimagining of sovereignty depends on normative judgments about when and how state autonomy should be constrained for the sake of a global common good. In short, just war theory applied to climate change naturally converges with climate justice. This convergence is not a weakness of the framework. It is a feature. It shows that the moral assessment of defensive action in the climate context cannot be conducted in isolation from the broader questions of fairness and responsibility that the climate justice literature has long been addressing.

3. Remaining Tensions

No framework of the kind I have proposed can resolve every difficulty, and intellectual honesty requires identifying the tensions that remain. Three are particularly significant, and each represents a genuine philosophical problem rather than a gap that additional research will straightforwardly fill.

The first concerns the relationship between the war diagnosis and the cooperative defense model. In Chapters 1 and 2, I argued that climate change possesses the normative structure of unjust aggression and that vulnerable states hold defensive rights analogous to those held by states facing armed attack. In Chapter 5, I argued that these defensive rights must be exercised cooperatively rather than unilaterally. There is a tension here, even if it is not a contradiction. The war framing emphasizes the rights of individual states to defend themselves against an ongoing wrong. The cooperative model constrains those rights by requiring coordination and mutual restraint. The resolution I offered—that cooperative defense is a consequence of the war diagnosis rather than an alternative to it—is, I believe, correct. But I acknowledge that it places significant demands on the framework. It requires vulnerable states to refrain from exercising rights that, on the war framing,

they genuinely possess, in favor of a cooperative process that may be slow, politically captured, or ultimately ineffective. If cooperation fails, the tension reasserts itself with full force: does a state facing annihilation retain the right to act unilaterally when the cooperative framework has failed to protect it? I believe the answer is yes, subject to proportionality constraints, but I recognize that this answer reintroduces the very problems that the cooperative model was designed to solve. This is not, I think, a flaw in the argument. It is a reflection of the genuine moral difficulty of the situation.

The next concern or tension is with regard to the operationalization of global proportionality. I have argued that proportionality must be expanded beyond its current narrow and wide categories to include a global assessment of the cumulative effects of defensive action. This proposal makes conceptual sense, but it raises serious practical questions. How, precisely, would global proportionality be calculated? Who would perform the calculation? What counts as a harm and what counts as a benefit in the context of a globally distributed atmospheric intervention with effects unfolding over decades? These are not merely implementation questions. They are questions about whether the concept of global proportionality is determinate enough to do genuine normative work. I believe it is, but I concede that its application will always involve significant uncertainty and reasonable disagreement. The alternative—leaving proportionality in its current form, unable to assess the distinctive harms of atmospheric intervention—is worse. But the expansion I propose is not a clean solution. It is an improvement on an inadequate status quo, and it will require continued development to become fully action-guiding.

The final tension, or at least the final addressed here, relates to sovereignty and the proposal for supranational governance. In Chapter 4, I defended a strong view of state sovereignty against revisionist accounts that would subordinate state obligations to individualist moral reasoning. In Chapter 5, I argued that this strong sovereignty claim actually supports the need for a limited form of supranational authority over climate-related decisions. The argument is that sovereign states facing a collective action problem of this magnitude need an institutional mechanism through which they can fulfill their obligations simultaneously rather than being forced into mutually destructive unilateral action. I stand by this argument. But I recognize that the transition from strong sovereignty to limited supranational governance is politically fraught and philosophically complex. The proposal requires that states voluntarily cede a portion of their sovereignty to a governing body that does not yet exist, in a domain where trust between states is low and the stakes are existential. What is more,

any such body would face the same legitimacy and representation challenges that plague existing international institutions. I do not have a detailed institutional proposal to offer, and I am not sure that one can be developed at the level of philosophical abstraction at which this project operates. What I can say is that the moral argument for such an institution is strong, and that the alternative, an anarchic system in which sovereign states exercise competing defensive rights over a shared atmosphere, is a recipe for the kind of mutually destructive conflict that just war theory was developed to prevent.

There is a further question that cuts across all three tensions, and it is one that I have engaged with throughout the project but not fully resolved: the relationship between just war theory and Rita Floyd's Just Securitization Theory. In Chapter 2, I argued that JST is not the proper replacement for JWT in evaluating geoengineering as self-defense. Floyd's framework treats climate change as a security emergency to be managed through exceptional governance; mine treats it as a form of unjust aggression that generates defensive rights for the threatened. I continue to believe that this distinction is important, and that JWT better captures the moral position of vulnerable states by centering their agency rather than treating them as objects of emergency governance. However, I also recognize that Floyd's diagnostic criteria—her conditions for evaluating when it is permissible to treat a problem as an emergency requiring extraordinary measures—identify a real gap in my account. The cooperative defense model and the proposal for supranational governance both involve precisely the kind of emergency authorization that Floyd's framework is designed to evaluate. Working out the precise relationship between JWT as I have developed it and Floyd's JST, not as competing frameworks but as complementary tools addressing different aspects of the same problem, is a task that this project has made tractable even if it has not fully completed it.

4. Final Thoughts

When I began this dissertation, my original intent was to dedicate a significant portion of my work to exploring the ethical implications of geoengineering, particularly SSI, as a response to climate change. However, as the project evolved, it became clear that geoengineering would not be the primary focus. Despite knowing from the outset that just war theory would be an important part of the discussion, I was still surprised by how it ultimately became the dominant theme of this dissertation. What began as an exploration of geoengineering's potential as a defensive tool shifted toward an extended assessment of where just war theory applies in the climate context, where it falls

short, and how it might be revised to address the moral complexities of climate change. This shift in focus exemplifies, I believe, the paradigm-shifting nature of climate change itself.

As climate change forces its way to the forefront of global challenges, it stretches the limits of our existing ethical frameworks. As Gardiner aptly describes it, climate change is indeed a “Perfect Moral Storm,” an unprecedented confluence of ethical, political, and practical challenges. These challenges lay bare the weaknesses and limitations of current moral theories, certainly, but not limited to, those related to war, sovereignty, and justice. The failure of these frameworks to effectively address the moral implications of climate change is not merely theoretical—it is a pressing reality that we must contend with if we hope to find a way forward. This dissertation, in mapping where just war theory applies, where it does not, and how it might be revised to do so, reveals how ethical paradigms developed for an earlier moral landscape now require substantial adaptation in the face of the existential threat posed by climate change. The tradition was not built with phenomena like climate change in view, and it is no failure of the tradition that it does not apply effortlessly here. What this work undertakes is to identify what just war theory can do in the climate context, what it cannot do as currently formulated, and where the most promising paths forward lie.

This realization, the need for more robust moral frameworks, may be one of the few positives to emerge from the tragedy of climate change. Just as extreme examples are often used to test the boundaries of ethical theories, climate change presents the ultimate “real-world” example, not a hypothetical one. The crisis at hand is not a distant thought experiment, but a tangible, immediate problem. It demands that our ethical frameworks evolve to meet the challenges of a globalized, interconnected world. In this sense, climate change represents an ethical crisis that necessitates a reevaluation of many of our moral assumptions and practices, compelling us to build stronger, more adaptable frameworks capable of addressing the unprecedented scale of environmental harm we face.

In the end, while this dissertation may have evolved into an extended engagement with how just war theory must adapt to a case it was never built for, this evolution itself exemplifies the forceful influence of climate change on our moral landscape. The very journey of this research, shifting from an application of just war theory to an assessment of where the tradition needs revision, shows how global warming pressures us to rethink what we once took for granted. Climate change has forced

me to reconsider our basic assumptions about responsibility, justice, and how we define “defense” against harm.

For me, as a generally cynical observer of humanity, this project ends with a variety of mixed feelings. On one hand, it’s disheartening. Examining climate change in the context of war and justice often amplified my cynicism; the failures of nations to act, the inadequacy of existing theories, and the sheer scale of suffering on the horizon can darken anyone’s view of our species’ moral progress. I have spent years thinking about worst-case scenarios and human shortcomings. It’s easy to conclude that we are too greedy, too divided, or too short-sighted to meet this challenge. And yet, against my own cynicism, I find a spark of hope persisting. It’s not a naive or unbounded hope, but a quiet, cautious optimism that flickers to life when I consider the potential hidden within this crisis. If climate change is forcing us to wake up, then perhaps it can also push us toward something new—maybe even something better. I believe (sometimes despite myself) that humanity might yet respond to this crisis in a way that leads to more than just reducing carbon or relocating people out of flood zones. We might, in the process of saving ourselves, undergo a kind of moral transformation. Perhaps we could emerge on the other side of this trial with a deeper sense of unity, with societies that are fairer and more compassionate.

Strangely enough, a significant source of this guarded optimism comes not from history or politics, but from science fiction narratives that have captured my imagination over the years. Throughout this project, when the academic texts and grim climate reports became too heavy, I often found myself reflecting on the stories that first made me believe in a greater human destiny. Science fiction might seem like an escapist tangent in a serious dissertation, but I’ve always felt that fiction can teach us about reality by analogy and inspiration. In fact, the more I think about it, the more I realize these imagined futures have guided my hopes for our real future. They offer visions of humanity enduring and growing past crises that, in the moment, seemed insurmountable. Three stories in particular have stayed with me as I ponder our current predicament: *Star Trek*, *The Expanse*, and *Interstellar*.²⁹⁰ Each paints a different picture of what we might become, and each, in its own way, helps me envisage a path from our troubled present to a more hopeful tomorrow.

²⁹⁰ *Star Trek*, created by Gene Roddenberry (Los Angeles: Desilu Productions, 1966–1969); *The Expanse*, developed by Mark Fergus and Hawk Ostby (Syfy and Amazon Prime Video, 2015–2022); *Interstellar*, directed by Christopher Nolan (Burbank, CA: Paramount Pictures, 2014).

Star Trek has long been my standard for an optimistic future. It depicts a world where humanity not only survives its 21st-century turmoil but transcends it. In the universe of *Star Trek*, Earth eventually overcomes war, poverty, and division to build a united, post-scarcity civilization. By the time of Captain Picard and the Enterprise, humans have put aside their old nationalistic conflicts and formed a Federation dedicated to peace, exploration, and mutual respect among many species. I remember being inspired by the idea that in the *Star Trek* future, hunger and want are eliminated, and learning and cooperation have become our driving pursuits. This vision may be fictional and far-off, but it matters because it shows that something better is conceivable. Notably, *Star Trek's* utopia doesn't emerge without struggle—lore behind the series mentions how humanity had to pull itself out of a dark age of war and inequality before achieving that unity. In other words, they got there *because* they confronted existential threats and global crises, not because those problems never happened. That resonates strongly now. I often think: could climate change be the crucible that eventually yields our own version of a Federation? The show's optimistic premise gives me a frame to imagine that after the hardship, humanity could collectively decide to change course. We might reject the patterns that led us to catastrophe and, instead, embrace a new ethos of global solidarity. *Star Trek* inspires me to believe that however cynical I may feel today, the future is not written—and it could surprise us in the best of ways.

If *Star Trek* is a beacon of idealism, *The Expanse* offers a more gritty and cautionary kind of hope. Set a couple of centuries from now, *The Expanse* portrays a humanity that has spread out from Earth to colonize Mars and the asteroid belt. This future is no clean utopia: old rivalries persist between Earth's United Nations, the militarized Mars, and the scrappy Belters who labor in the outer reaches of the solar system. Watching or reading *The Expanse* often reminded me that humans carry our baggage with us—we don't change overnight just because we have new technology or a new frontier. In that story, there are still politics, inequality, and conflict; at times the factions go to war. And yet, *The Expanse* is ultimately a story about overcoming division in the face of greater challenges. Time and again, when confronted with threats that endanger all of humanity (an alien protomolecule, an impending catastrophe at the gates of new worlds), the people of Earth, Mars, and the Belt find ways to cooperate, however grudgingly. By the end of the series, we see hints that these disparate groups can form a new kind of community—imperfect and fraught, but real. Humanity in *The Expanse* avoids destroying itself and instead becomes an interplanetary civilization. To me, this is a critical point: despite all the strife depicted, *The Expanse* shows that we *can* change

our relationships with each other when the stakes are high enough. We can set aside some grievances and establish new treaties and organizations (in the story, even a shared government for managing the Ring space). In our real world, the climate crisis might play a similar role to the existential threats in *The Expanse*, pushing nations to cooperate in unprecedented ways because the alternative is mutual ruin. The lesson I draw from this narrative is that progress may not be pretty or linear, but it is possible. Even if our future looks more like the messy realism of *The Expanse* than the utopia of *Star Trek*, it would still mean that we endure and advance. We would have made it through the gauntlet of climate change and lived to take humanity to the next stage—perhaps to other planets, having learned tough lessons about working together.

Where *Star Trek* and *The Expanse* deal with societies and their trajectories, Christopher Nolan's *Interstellar* brings the focus down to the personal, to the human heart at the center of an existential crisis. *Interstellar* is essentially a story about a climate-induced apocalypse—an Earth that can no longer sustain humanity—and the desperate attempt to find salvation among the stars. What moves me about *Interstellar* is not just its sweeping visuals or scientific imagination, but its insistence on qualities like love, sacrifice, and faith in one another as essential to our survival. In that film, astronauts and scientists risk everything, leaving their families behind, because they believe humanity has a future worth fighting for. Cooper's journey through the wormhole in search of a new home for humanity is spurred as much by his love for his daughter as by his training or duty. Dr. Brand's line, "Love is the one thing that transcends time and space," might sound sentimental, but in the context of the story it captures a powerful idea: that our bonds to one another can motivate us to achieve the impossible. *Interstellar* does not shy away from showing tragedy and sacrifice—Cooper and Brand face heartbreak, and not everyone makes it—but ultimately it is a tale of hope amid catastrophe. Humanity in *Interstellar* finds a way to escape extinction, not by miracle, but through ingenuity *and* the willingness of people to put the common good above themselves. The film ends with humanity surviving—living in space habitats and, presumably, on other worlds—because a few brave individuals refused to give up, and because they trusted in values like love and courage just as much as in equations and machines. When I reflect on our real climate crisis, I often think of *Interstellar*'s message. It suggests that even when things look bleakest, human beings can surprise you with their capacity for empathy and selflessness. For all my analytic bent as a philosopher, I find it meaningful that *Interstellar* elevates an emotional truth: that data and logic alone won't save us, we also need heart. In facing climate change, hard science and policy are indispensable, of course—but so are

solidarity, empathy, and the determination to care for people we've never met and future generations who haven't been born. *Interstellar* reminds me that those human qualities are not trivial; they could make the difference in whether we succeed or fail in the coming century.

These stories—*Star Trek*, *The Expanse*, and *Interstellar*—are, of course, fiction. I am fully aware that our reality is more complex and no scriptwriter can guarantee us a happy ending. What these tales have in common is a conviction that humanity does have a future, and that we are capable of growth in the moral sense. They dare to imagine that after all the struggle, we learn something, and we become something greater. The characters in those science fiction narratives didn't give up when faced with planetary peril or societal collapse—they persevered, adapted, and kept their eyes on a horizon beyond the crisis. Likewise, we have a chance to view the climate challenge not just as an inevitable tragedy, but as an opportunity to galvanize humanity's better instincts. We can choose to let it divide and doom us, or we can choose to let it unite and elevate us. And if enough of us choose the latter, even haltingly and imperfectly, then the future could hold something truly inspiring. It might not look exactly like a Federation starship council, or a peaceful Solar System alliance, or a dramatic exodus through the stars. Our real future will have its own unique shape. But the essence of those visions—a humanity that endures its trial by fire and comes out wiser and more compassionate—is worth striving for.

As I conclude this dissertation, I find that my outlook has subtly changed. The philosophical analyses and critiques of just war theory herein were driven by a worry: that our old ways of thinking may fail us under climate change. That worry is still present. But alongside it, I feel a cautious optimism that wasn't there when I began this work. It's an optimism tempered by realism—I know there's no guarantee we'll achieve a *Star Trek*-like utopia or any grand redemption. Yet, I hold onto the belief that we can choose a path of profound cooperation and ethical growth. Climate change will push us to our limits; it will test our institutions, our values, and our empathy. We will likely see hardship and loss that none of us want to imagine. Still, within that test lies the possibility of forging something new. We could re-imagine our relationship with each other and with our planet, perhaps developing a global consciousness that today only exists in fiction. In a sense, confronting climate change might teach us the true meaning of a "just war" – not a war between nations at all, but a war for the future of humanity, one fought with science, solidarity, and courage rather than weapons.

And if we fight that good fight together, we may discover that victory is more than just survival. It could be a world transformed.

I will not pretend to know how our story will end; unlike a scripted saga, our future remains open and uncertain. But as I finish this work, I do my best to blunt my cynicism, at least slightly. Maybe there is reason to hope. It certainly needs to be a careful, watchful hope, backed by the knowledge of how much work and change is required. And it has to live alongside my skepticism, challenging it without dismissing it. In closing, I will simply say that if climate change is a dark chapter in the human story, it need not be the final chapter. We have the capacity to write next chapters that our children and their children will be proud of. My sincere hope—one I never thought I'd voice with such conviction—is that humanity will not only solve the climate crisis, but also be changed by it in profoundly positive ways. We may find, in our response to this great threat, the seeds of a greater unity and a deeper justice than we have ever known. And that hopeful possibility, however uncertain, is a fitting note on which to end this journey.

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