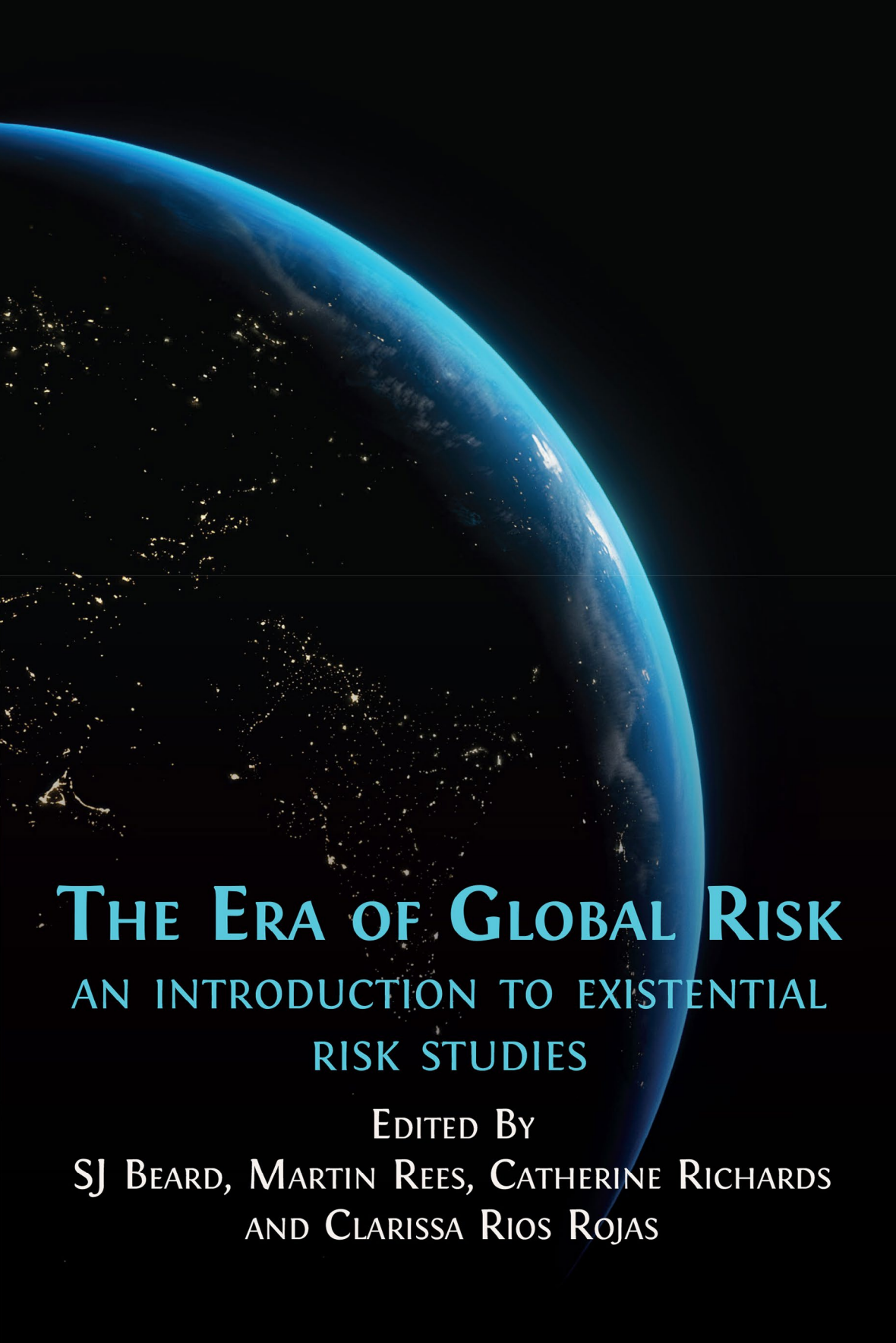

The Era of Global Risk

An Introduction to Existential Risk Studies

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4. Beyond 'Error and Terror': Global Justice and Global Catastrophic Risk

Natalie Jones

This chapter is an invitation to consider global political, economic, social, and legal systems, particularly in relation to global justice and inequality, when studying and addressing global catastrophic risks. Such a focus can provide a powerful complement to work concentrating on the role of individuals in the production of risk. I argue that to examine global catastrophic risks without a global justice lens is to distort our understanding of those risks; adding a global justice lens onto our existing strategies can help us see the nature of risks more clearly. Strategies to reduce global catastrophic risk will be more effective if they take global justice considerations into account. Further, policies to reduce global catastrophic risk reduction can—and should—be designed so as to simultaneously mitigate risk and deliver more just outcomes.

So far, a large focus of the study of global catastrophic risks has been 'error and terror': that is, the ways in which individuals and/or small groups of people can cause global catastrophe. More recently, researchers have paid more attention to the role of institutions—including corporations and governments, as well as that of systems—in causing, preventing, and responding to catastrophe. This chapter briefly canvasses these shifts, before proposing a case for a justice lens, using the example of climate change. The chapter ends with suggestions for further research.

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'Error and terror': Global catastrophic risks from individuals

A key strength of academic work on global catastrophic risks to date has been its approach to studying the ways in which individuals and small groups can cause global catastrophes. Somewhat representative of this approach is Martin Rees' treatment of global catastrophic risk in his 2002 book *Our Final Century*, followed up by his 2018 volume *On The Future*.[1] In his words, risks "may come not primarily from national governments, not even from 'rogue states', but from individuals or small groups with access to ever more advanced technology".[2] Existential hazards could be triggered by ordinary citizens, no longer only by world leaders with nuclear buttons at their fingertips.[3] The discussion of risks posed by individuals focuses largely on two possibilities, referred to by Rees (as here) by the terms 'error' and 'terror'. This distinction was also made by Nick Bostrom in his influential 2002 article on existential risks, during his discussion of "bangs"—relatively sudden disasters arising from either an accident or a deliberate act of destruction.[4] And the error-terror framing continues to hold resonance in recent work—for instance, in Ord (2020).[5]

Error invokes the possibility of mistakes or accidents in, for example, scientific research on bio- or nanotechnology.[6] Gain-of-function experiments—whereby viruses are altered with the intent to better understand pandemics—could go wrong, resulting in the leak of vaccine-resistant or more virulent viruses from laboratories.[7] Nanomachines that assemble copies of themselves could accidentally be released, whereupon they might proliferate unstoppably, consuming all the Earth.[8] A superintelligence might be badly programmed, with researchers making a mistake that ends up giving the superintelligence goals that lead it to wipe out humankind.[9] In this way, individuals or small groups may, by their actions or inactions, pose a threat to the whole world.

Meanwhile, *terror* is the idea that individuals or groups with malicious intentions may trigger technological weapons, such as engineered viruses or nuclear devices, with the aim of carrying out mass destruction.[10] Rees cited past bioattacks and apocalyptic suicide cults (such as those carried out by the Rajneeshee cult in 1984 and the Aum Shinrikyo sect in the early 1990s)[11] to suggest that private individuals

might well have the motivations and skills to pose an existential threat. Many of the same examples are drawn upon in Toby Ord's recent book, *The Precipice*.[12] Bostrom, likewise, was concerned about the "tyrant, terrorist or lunatic" who might create a "doomsday virus"—that is, a virus combining long latency with high virulence and mortality.[13] Rees predicted that thousands or even millions of individuals could someday acquire the capability to manufacture bioweapons,[14] due in part to the 'dual use' nature of such technologies: the equipment needed to create lethal substances is the same as that required for common medical or agricultural applications.[15]

Much further work has followed, directly or indirectly, from this analysis. On the more abstract end, Emile Torres elaborates upon the concept of 'agential risk', which directly draws on the 'terror' concept.[16] Torres lays out a typology of human agents who would destroy the world if they had the capabilities to do so. In his view, this includes "apocalyptic terrorists", "misguided moral actors", "ecoterrorists", and "idiosyncratic actors" such as rampage shooters.[17] On the more specific end, many researchers have considered, in depth, ways in which risks from accident or misuse of biotechnology may be mitigated,[18] while others have examined possibilities for the malicious use of artificial intelligence.[19] Still others have considered how individual cognitive biases—such as confirmation bias and hindsight bias—can play into global catastrophic risk, including (but not limited to) terror and error scenarios.[20]

Beyond individuals to institutions and systems

Of course, work on global catastrophic risk has not been limited solely to an individualist framing of threat. In addition to the continued focus on individuals, global catastrophic risk researchers have also started to consider how systems, institutions, and governance contribute to causing—as well as failing to prevent, mitigate, or adequately respond to—global catastrophe.

Even earlier work that focused predominantly on terror and error also contained some reference to broader institutions, whether explicit or implied. Rees in *Our Final Century* extensively discussed the risk from nuclear weapons—largely the domain of state actors—and considered the merits of government regulation of biotechnological

research to mitigate risk[21] (for instance), while Bostrom's 2002 categorisation of existential risks included examples like "misguided world government" or a "repressive totalitarian global regime", as well as examples along more agential lines.[22] Rees' later work considers the role of economic growth, distribution of wealth, and the short-termism in politics, and proposes government policies to address climate change.[23] Governments are, in this way, seen as part of the problem or, potentially, part of a solution.

Later work has refined these intuitions. In this vein, Avin et al. (2018) construct a framework for classifying global catastrophic risks based on "critical systems" for humanity's survival, including socio-technological systems, mechanisms by which a threat spreads worldwide, and failures to prevent or mitigate, including institutional and "beyond institutional" fragilities.[24] Relatedly, Liu, Lauta, and Maas (2018) urge moving beyond a hazard-centric approach—which would, for instance, focus on malign or error-prone individuals triggering harmful technologies—to one that also takes into account vulnerabilities and exposure, and urge a focus on governance.[25] They note "many other, slower and more intertwined ways in which the world might collapse" other than spectacular hazards.[26] Among the vulnerabilities they mention are several that implicate governance, institutions, and systems: "globalised economic and institutional frameworks", "market dependency", "homogenous global monoculture in practices and ideology", and "globalised diets and food demand". Similarly, Kuhlemann (2019) has urged increased focus on epistemically messy, creeping risks arising from "gradual damage to collective goods" and economic "growthist" paradigms, rather than those neatly attributable to "villainous or blundering agents"—that is, error and terror.[27] Cotton-Barratt, Daniel, and Sandberg (2020), in their categorisation of existential risks, include categories corresponding to error and terror ("accident risk" and "malicious risk", in their terminology), but also add that risks can be "latent", in that many people pursue an activity which causes global damage without knowing that it does so—for instance, burning fossil fuels before scientists realised that doing so caused global warming—or "commons", whereby many people are aware of the damage and engage in the activity anyway—for instance, burning fossil fuels now. Here, one could read in the existence of

broader structures that incentivise people to engage in such an activity.[28] Finally, Kreienkamp and Pegram (2020) consider systems approaches to global catastrophic risks, including complexity theory.[29] They discuss how global catastrophic risks are "systemically produced and amplified", pointing to "tightly coupled linkages of global social, economic, technological, and ecological systems". Kreienkamp and Pegram distinguish between risks that are severe but not very complex, such as asteroid impact or nuclear war, and those with high levels of "connectivity, openness, nonlinear dynamics, and emergent properties that produce frequent surprises" such as climate change, using this insight to propose design principles for governing complex global catastrophic risks.[30]

Complementing agential approaches with systemic and global justice approaches

What the works discussed in the section above have in common is that they move beyond considering only (or mainly) the role of individuals as mistaken or malicious perpetrators of catastrophe. Rather, they invoke the possibility of global catastrophe for which no one individual or small group is responsible, where broader systems are at play. They start to unpack the complexities involved in effectively managing and responding to risk. The increasing focus on systems as a complement to agential, 'error and terror' approaches is indispensable for understanding global catastrophic risk. For one thing, systems shape the incentives, opportunities, pathways, and barriers that individuals face. Much economic and legal thought takes this as given. Prominent schools of thought in sociology recognise that individuals are not solely in control of their own actions and destinies, but rather express agency in the context of pre-existing social structures—though they are also capable of exercising their agency to change those structures.[31] We could then understand individuals involved in error-terror scenarios as embedded in societal, cultural, political, economic, and legal systems, which opens up new research avenues for scholars of global catastrophic risk. For another thing, if we understand risk as composed of hazard, vulnerability, and exposure, the latter two elements inherently invoke systems (as outlined in Liu,

Lauta, and Maas, 2019). Furthermore, many proposed policy solutions for global catastrophic risks would have flow-on implications for the functioning of global systems. This is illustrated, at the extreme end, by Martin Rees' discussion of possible solutions to the risks posed by dual-use technologies—proposals which would irreversibly transform the global political economy. These could include establishing an oppressive police state, which might be the "least-bad safeguard", as the only way to ensure total government control over the manufacture and use of dangerous technologies.[32] Although "deeply unpalatable", Rees acknowledged, this might still be seen as necessary.[33] Another proposal is the "dystopian prospect" of using drugs, genetic modification, or brain implants to "stabilise" those "drawn towards the disaffected fringe"—in crude terms, mind control.[34] However, such proposals need not be so radical in order to interact with, and alter, existing systems.

Notwithstanding the many valuable and worthwhile contributions to date, much space remains for further work. In particular, when considering how global catastrophic risk is co-created by agents alongside institutions, systems, and governance aspects, there is particular room for engagement with questions of justice. How is the production of global catastrophic risk linked to global injustices? Who is more or less affected by a given risk? Who benefits and loses from interventions to reduce or respond to risk? The remainder of this chapter argues that if global justice considerations are omitted from our analyses, we will not clearly understand the nature of global catastrophic risk. Rather, further study of *global* social, political, and economic systems (and the justice thereof) will improve understanding of how global catastrophic risk is produced and maintained, and how it may be prevented, managed, and effectively responded to. Moreover, we can design policy interventions to effectively respond to both global justice and global catastrophic risk considerations. We can understand these ideas by considering a prominent case study—climate change—which demonstrates the linkages between global catastrophic risks, global systems, and justice.

Global justice and the climate crisis

The nature of the problem

Questions of global equity, fairness, and justice lie at the heart of debates on the global response to climate change.[35] The basic issue is this: the poorest nations, which consume the least material resources, have generated minimal greenhouse gas emissions. At the same time, these countries are disproportionately vulnerable to the effects of climate change, to which they are least equipped to respond. In many such countries, access to energy to underpin basic needs is still a challenge. Conversely, the wealthiest nations—which consume the most and have produced the largest cumulative emissions—tend to be less vulnerable to many climate impacts, and are better resourced to adapt, as well as to reduce their emissions. From 1751 to 2017, the United States generated around 25% of all carbon dioxide emissions; the European Union and the United Kingdom were responsible for another 22%; China saw 12.7%, while India, the continent of Africa, and that of South America produced around 3% each.[36] Slicing it another way, from 1990–2015, a period which saw as much cumulative emissions as the entirety of 1751–1989, the richest 10% of the global population was responsible for 52% of cumulative carbon emissions, while the poorest 50% accounted for 7%.[37] Meanwhile, the Climate World Risk Index shows that the most exposed and vulnerable countries are lower-income countries that have contributed least to greenhouse gas emissions.[38] Scientists have warned that the consumption of affluent households worldwide is "by far the strongest determinant and the strongest accelerator" of climate impacts.[39] Indeed, global warming has likely exacerbated global economic inequality over the last 50 years by 25%, due to the fact that warming has increased economic growth in cool countries and decreased growth in warm countries.[40]

This is no mere coincidence. Scholars of history and political economy have shown how, for centuries, global economic and political systems have operated to extract wealth from the Global South to the Global North, via colonisation and imperialism, and climate change can be traced back to the operation of these systems.[41] Scholars of neocolonialism have shown how, despite the end of formal empires in

the mid-20th century, a model of economic globalisation evolved that protected and extended the inequalities and exploitation of the colonial era.[42] A country's history of being colonised continues to be indicative of per-capita levels of poverty.[43] And, in the last decade, there has been a close interlinkage between far-right, white nationalist politics and the politics of climate denial and delay.[44]

These global patterns are replicated within nations. Wealthier communities are more resilient to climate impacts, while contributing more to emissions. Conversely, low-income communities, racialised or minority ethnic communities, people with disabilities, older people, women, and indigenous peoples tend to be more susceptible to risks posed by climate impacts. The relationship between environmental quality and inequality is well established.[45] When it comes to extreme weather events (among other disasters), hazard and disaster research has clearly demonstrated that social inequalities shape disaster management and response.[46] The spectacle of private firefighters protecting the homes of high-net-worth individuals during the 2018–2020 California wildfires—while public firefighting forces were, in part, made up of prison inmates—brought this point home.[47] Elsewhere, systemic racism was found to be a barrier to disaster response in the wake of major hurricanes in Puerto Rico.[48] In the UK, coastal flooding (which will become more frequent and severe due to climate change) poses a much higher risk to deprived communities, partly because such communities disproportionately make up ex-industrial ports and declining resort towns.[49] These are just a few examples of a widespread pattern.

Against this backdrop, a key challenge of our time is how to rapidly reduce greenhouse gas emissions so as to meet a carbon budget compatible with limiting global warming within the internationally recognised safe limit of 1.5˚C, *and to do so in a fair and just way*. It is important to note that inequalities are relevant not only in respect of causation and impacts of climate change, but also in relation to the effects of climate change response measures.[50] There have already been well-documented cases where interventions primarily meant to reduce emissions (or adapt to climate impacts) have served to further entrench (global) inequalities. The construction of hydroelectric reservoirs has led, in many countries, to the forced displacement of already marginalised people and communities, with deleterious social

consequences.[51] Incentivisation of ethanol use as an alternative fuel in order to reduce emissions from transportation has led to the use of food crops for ethanol, causing hardship in poorer communities due to higher food prices and consequent lack of food security.[52] Meanwhile, measures to shift away from fossil-fuel production can inflict severe damage on communities dependent on the incomes derived from coal, oil, or gas extraction, if not designed with the interests of workers and communities at heart so as to (for instance) retrain workers and clean up damaged environmental sites.[53] Cobalt and lithium mines, containing crucial materials for manufacturing battery and solar technologies, also happen to be found in low- and low-middle-income countries, raising the prospect that the uptake of electric vehicles and solar panels in early-adopter (wealthier) nations could come at the expense of poorer communities in countries like Chile, Bolivia, and Serbia.[54]

But this does not have to be the way. Rather, climate policies can be designed to simultaneously bolster climate action and justice. The 'just transition' literature and community of practice explores how to transition to a zero-carbon society in a way that does not strand workers and communities, but rather protects livelihoods, workers' rights, and quality jobs.[55] Another parallel strand of work shows how climate policy and human rights can be aligned.[56] In countries like the US and UK, Green New Deal policies would aim to simultaneously tackle inequality and climate change,[57] although a key area of contestation is presently how to design such policies to also take proper account of global justice.[58] Many political proposals have been devised for the fair and just allocation of emissions reduction burdens,[59] including the allocation of emissions rights to countries based on an equal per-capita allocation,[60] and an approach based on countries' historical responsibility for cumulative emissions.[61]

The international politics of equitable burden-sharing

Against this backdrop, let us turn, for a moment, to briefly take stock of how key international political and legal accords on climate change have taken account of global equity and justice considerations. Far from a marginal or secondary issue, differential historic responsibility for—and vulnerability to the impacts of—climate change has taken centre-stage over nearly three decades of international climate negotiations.

The principle of common but differentiated responsibilities and respective capabilities (CBDR-RC) was agreed by countries in the 1992 UN Framework Convention on Climate Change (UNFCCC)—which, as of the time of writing, includes 197 states parties.[62] Under CBDR-RC, developed country parties should take the lead in combating climate change and its adverse effects. The UNFCCC, accordingly, provided for a higher standard of obligations for countries included in its Annex I—a list of countries then considered to be industrialised, comprising the OECD plus former Soviet states undergoing the transition to a market economy—compared with those of other countries, an approach known as 'differentiation'. To operationalise the Framework Convention, state parties then agreed to the Kyoto Protocol in 1997. The Kyoto Protocol continued the differentiation approach, making a rigid distinction between industrialised (Annex I) and all other (non-Annex I) countries. Binding, quantitative, absolute emissions reduction or limitation targets were imposed for the former but not the latter. This proved problematic, as the Annex I and non-Annex I categorisation established in 1992 was widely seen as outdated, at least in the Global North. In the intervening years, countries like China, Brazil, South Africa, and others have seen their economies (and emissions) rapidly expand.[63]

The Paris Agreement of 2015 ended the strict differentiation between Annex I and non-Annex I parties, requiring *all* countries to submit national climate action pledges, known as nationally determined contributions (NDCs). However, the Agreement still distinguishes between "developing" and "developed" countries on certain issues, and contains a "subtle differentiation" for specific subsets of countries and on certain issues such as finance, capacity-building, technology transfer, and reporting.[64] Countries can, and do, make the magnitude of their emissions reduction and climate adaptation pledges in their NDCs conditional on receiving international support from wealthier countries.[65] The level and type of finance and other support to be provided by "developed" countries to "developing" countries is still a key political issue in the UN climate negotiations.[66]

This foray into international climate law and politics, while brief, aims to provide a window into the long and contentious history of international discussions on climate change and global justice issues. The point that scholars of global catastrophic risk might take away is that, when working on or researching global governance of such risk,

one cannot ignore political questions of differential causation and harms. If working through multilateral institutions, countries who are disproportionately impacted will raise their concerns, and countries with disproportionate responsibility will face corresponding challenges. Global justice will, in other words, rear its head. In the climate sphere, countries with disproportionate responsibility—like the UK, EU, and US—have long sought to play down these considerations, which has mainly resulted in undermining global trust and delaying action by all countries on climate change.

Structural complications and (partial) structural solutions

How do climate policy solutions that take account of global justice differ from climate policies that ignore global justice? For the purposes of illustrating this difference, let us now consider some structural barriers to effective, global climate action, and how these may be overcome. Global (carbon) inequality and the climate crisis in general (as mentioned above) are enmeshed in and compounded by various global social, economic, political, and legal structures, which actively hinder just and safe climate mitigation. The rules and institutions of global economic governance are particularly pertinent here—for example, investor protection, debt governance, and intellectual property regimes. First, rules on protections for foreign investors limit countries' abilities to put in place environmental regulations like carbon taxes, stronger performance standards, emissions limits, and the denial of permits for fossil fuel development. Investor-state dispute settlements have been used by multinational enterprises to challenge actions like these.[67] These agreements have also tended to deepen global inequalities by enhancing the power of foreign investors (largely, though not exclusively, multinational enterprises based in wealthy countries) relative to citizens.[68] Poorer countries have more limited resources to defend against such cases, and are thus likely to come under pressure to abandon or delay climate policy measures.[69] Researchers have developed proposals on how such agreements may be amended—or how countries may strategically withdraw from them—in order to improve climate policy.[70]

Second, multilateral debt poses another significant barrier to climate action and to justice. Developing countries' levels of debt—to the IMF,

the World Bank, and bilateral creditors—have risen from around 30% of GDP in 1960 to 170% of GDP in 2019, totalling more than $8 trillion.[71] On average, by 2018 developing countries were spending in excess of 10% of their revenues on debt repayments, though some countries spend 20% or even up to 70%.[72] High repayment levels constrain these countries' fiscal space to respond to climate change (as well as to enact other public priorities, such as education or healthcare), and contribute to debt crises. When climate disasters hit, countries are forced to take on further loans to finance recovery and reconstruction, due to a lack of other options.[73] Countries situated at the intersection of high levels of indebtedness, greater climate vulnerability, and low access to credit are the most prone to debt crises and inability to finance climate priorities.[74] Indeed, combined with debt repayments, levels of tax avoidance and the extraction of profits by multinational companies, this often means that poorer countries lose a lot more wealth than what they receive in aid.[75] In 2015, Sub-Saharan African countries received over $160 billion in loans, aid, and investment, but lost at least $203 billion, including from tax avoidance, debt repayments, illegal logging and wildlife trade, and the extraction of profits by multinational companies to their home countries.[76] Policy proposals regarding debt jubilees, debt-for-climate finance swaps, increased use of International Monetary Fund (IMF) Special Drawing Rights, and other ideas to reduce debt burdens while fostering climate action have accordingly been gaining more traction.[77]

Third and finally, the international intellectual property regime has been another barrier to globally just climate action. With industrialised countries and major emerging economies dominating the environmental technology market,[78] intellectual property rights have been found to reduce imports of solar technologies into non-OECD countries.[79] Meanwhile, countries that bear a higher share of historical responsibility stand to gain from selling proprietary technologies to the countries that will suffer most.[80] Similarly to the much-publicised proposal for an intellectual property waiver to enable a rapid and just rollout of COVID-19 vaccines,[81] scholars and advocates have proposed the waiver of intellectual property rights to allow for the global distribution of renewable energy and energy efficiency technologies at scale and at speed.[82]

Global catastrophic risk's characterisations of climate change

Against these understandings of climate change as intertwined with issues of unequal benefit and harm, let us now return to the ways in which climate change has been addressed in work on global catastrophic risk. Upon examination, we can see that questions of global justice are not addressed, and that this distorts how climate change is understood. First, there is a tendency to view climate change as a 'commons' issue: that is, a problem caused by the cumulative actions of many people, who engage in burning fossil fuels and climate-unfriendly land-use practices in the knowledge that this causes climate change. From this viewpoint, climate change is viewed as a simple coordination failure, a problem of externalities not being sufficiently addressed within the market. Differential responsibility for—and harm from—climate change is flattened. In this vein, Ord (2020) characterises climate change as involving 'the aggregation of small effects from the choices of everyone in the world';[83] Kuhlemann (2019) says the harm arises from "gradual harm to collective goods" and is "driven by the aggregate impact over time of human populations, people behaving as they normally do".[84] Cotton-Barratt, Daniel, and Sandberg (2020) characterise climate change as a "latent risk" where "many people pursue an activity which causes global damage, without knowing that it does".[85] Similarly, Liu, Lauta, and Maas (2018) characterise climate change as a risk arising from "passive" vulnerabilities and "indirect" exposure, whereby a risk is indirectly caused by societal arrangements intended for something else.[86]

Works such as these do not mention the differential responsibility for, causation of, and vulnerability to climate change among 'human populations'. This oversight, although likely unintentional, has flow-on implications for how climate change is understood and addressed as a global catastrophic risk. Even if the role of poorer countries is mentioned, the question of historic responsibility tends to go unaddressed. For instance, Rees (2018) rightly notes the need for "developing countries" to "leapfrog directly to a more efficient and less wasteful mode of life"[87] in the course of a lengthy discussion of climate policy options, but neglects to mention the responsibility (both political and legal) of developed countries to provide support for this, nor the differential role of wealthier and poorer countries in causing the problem.

Where to?

I have argued that, by disregarding global justice considerations, scholars of global catastrophic risk have tended to misunderstand the nature of the climate change problem and how to solve it. Climate change is only one case study, albeit illustrative for global catastrophic risk in general. With the lessons from the climate in mind, further work might consider how the forces driving the development of dangerous technologies arise from existing political economies and associated societal and legal arrangements, how these technologies place differential burdens and cause differential harms, and where (unexpected) allies in the quest to avoid their risks may be found. More generally, further work could consider how efforts to reform global economic structures—including restructuring aid and development models, intellectual property laws, and trade and investment regimes—could support the agenda of reducing global catastrophic risk. We might consider whether (and how) redressing global injustices can be aligned with—and actively help with—reducing global catastrophic risks. And we might consider who benefits the most, and conversely, who experiences the highest costs, from policies to mitigate global risk. We could then consider how to adjust and design these policies accordingly. Research and scholarship is particularly needed on the relationship between global justice and injustice, and areas of global catastrophic risk other than climate change—for instance, nuclear, biorisk, volcanoes, and AI. In some cases, there is already extensive work in existence—think of the research on AI and inequality, or pandemic vaccine equity—that could be usefully synthesised and incorporated into a more holistic—and accurate—study of global catastrophic risk.

All of this could complement more targeted measures to mitigate risks from individual misuse of technology. In other words, this is not to say that terror and error are entirely unimportant. Evidently, the dual use of potentially dangerous nano- and bio-technology is a major concern, and there will always be a place for technical work on how to mitigate these risks. It is also important to consider how a given person can best act—within the constraints due to their structural location in the political economy of society—to address global catastrophic risk, not least because this helps us understand our own opportunities and responsibilities for action. But these approaches are not sufficient to address global catastrophic risk.

We may also learn from the global climate response in one final respect. From the beginning of international discussions on climate change, many governments—perhaps most prominently that of the United States—largely dismissed the need for a justice component. Equity was viewed as an unnecessary barrier to action. They pushed for emissions cuts to be carried out by all countries, while not offering to provide financial, technical, or technological assistance to poorer countries for either mitigation or adaptation.[88] Poorer countries understandably rejected this as inconsistent with their vital interests in development, and thus the foundations for 30 years (and counting) of international disagreement on how to tackle climate change were laid. When it comes to emerging global catastrophic risks, which have not yet been the subject of extended discussion or policymaking at the level of international relations, we have a chance to get international politics right from the start. This means, where a given risk intersects with global justice, we can make sure to factor these considerations in when assessing policies to mitigate it. Some politicians in rich countries may consider this unnecessary. But, in the face of escalating risks, and the prospect of decades of resistance or political deadlock as in the case of climate change, the question is, can the world really afford not to address global justice in dealing with global catastrophic risk?

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22 Bostrom, N. (2002). See also Bostrom, N., 'Existential risk prevention as global priority', *Global Policy, 4*(1) (2013), p.15, 27, noting "institutional incompetence" and "political exploitation of unquantifiable threats" as barriers to effective mitigation of existential risks.

23 Rees (2018), see e.g. 26–28, 46–49.

24 Avin et al. (2018).

25 Liu, Lauta, and Maas (2018). Vulnerability denotes the propensities or weaknesses within social, political, economic, or legal systems that increase the likelihood of humanity succumbing to risks, whereas exposure denotes the number, scope and nature of the interface between the hazard and the vulnerability.

26 P.10.

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