Climate Engineering and Human Rights

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Abstract

Climate change threatens to infringe the human rights of many. Taking an optimistic stance, climate engineering might reduce the extent to which such rights are infringed, but it might also bring about other rights infringements. This Forum, leading off the special issue on climate engineering governance, engages three scholars in a discussion of three core issues at the intersection of human rights and climate engineering. The Forum is divided into three sections, each authored by a different scholar and discussing a distinct aspect of this relationship. First, Toby Svoboda gives an overarching view of three competing approaches to human rights, grounded in philosophy; then, Holly Jean Buck looks at lessons from how the climate migration conversation brings a human rights approach to a climate policy issue; and finally, Pablo Suarez illustrates how a humanitarian approach to climate engineering works with a human rights framework. The conclusion of the Forum draws together points of overlap across the three sections and suggests a path forward for policy and research on this topic. Together, the sections show that climate engineering, should it materialize, will pose novel human rights challenges, and may well force reconsideration of how human rights are applied as a guide to action.

Introduction

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Climate change threatens to infringe the human rights of many. Taking an optimistic stance, climate engineering might reduce the extent to which such rights are infringed, but it might also bring about other rights infringements. This Forum, leading off the special issue on climate engineering governance, engages three scholars in a discussion of three core issues at the intersection of human rights and climate engineering. While a human rights framework for climate engineering governance is a topic of increasing discussion in the gray literature (Burns, 2016; Smith, 2016); this Forum draws together contributions from three different fields to help illustrate the uses of such a framework, as well as the nuances of different approaches to human rights. The conclusion of the Forum draws together points of overlap across the three sections and suggests a path forward for policy and research on this topic. Together, the sections show that climate engineering, should it materialize, will pose novel human rights challenges, and may well force reconsideration of how human rights are applied as a guide to action.

In the first section, Toby Svoboda discusses three competing philosophical approaches to addressing human rights infringements in the face of climate change and climate engineering (vis solar radiation management, or SRM). He argues that some approaches are likely to be more helpful than others when it comes to balancing the competing human rights implications of climate engineering policies on the one hand, and climate change burdens in the absence of such policies on the other hand. The central problem is that SRM might protect some rights at risk of infringement due to climate change while also infringing other rights that would not have been infringed had SRM not been deployed. However, virtually any climate policy would involve shifting climatic burdens in some way. Svoboda explores how three approaches to incorporating human rights in assessing climate engineering policies address these shifts of burdens.

Holly Jean Buck then turns to a discussion of the connection between human rights, climate engineering and broader climate policy. She suggests that the ways in which climate migration is taking a human rights based approach are useful for examining how climate engineering might do so, identifying three lessons: the need to integrate expertise and knowledge about climate engineering and issues like migration, the need to plan for migration in anticipatory governance, and the need to establish funds for vulnerable people such as migrants who might suffer negative impacts from climate engineering interventions.

In the third and final section, Pablo Suarez examines both needs-based and rights-based humanitarian approaches to thinking about climate engineering. He notes two key questions: what role would vulnerable populations play in making decisions about climate engineering, and who would pay for humanitarian operations in a future in which climate engineering is deployed? The first question fits most readily into a rights-based approach, for it hinges on what parties have a right to contribute to such decisions. Once again, this is not only a question about climate engineering, but also climate policy more generally. This highlights, as Buck also notes, that the question of climate engineering should not be isolated from broader questions about development and moral responsibility.

Competing Approaches to Human Rights Infringements Under Climate Engineering
Toby Svoboda

Anthropogenic climate change may infringe the human rights of some, including rights to life, subsistence, and health (Caney, 2010). There may also be distinctively environmental rights to a safe environment or a stable climate, which are threatened by anthropogenic climate change (Nickel, 1993; Vanderheiden, 2008). Climate engineering with solar radiation management (SRM) could alleviate some of these threats, such as by slowing the rate of

temperature increase (MacMartin et al., 2014). Yet SRM threatens to infringe certain human rights as well, such as by significantly weakening the hydrological cycle, which could reduce some parties' access to freshwater (Tilmes et al., 2013). Importantly, the set of persons whose rights may be infringed by SRM would likely be non-identical to the set of persons whose rights may be infringed due to anthropogenic climate change. This poses a difficult question for decision-making within a human rights context: would it be permissible to put the human rights of some at risk of infringement in order to protect the human rights of other persons? In this section, I consider three competing philosophical models for addressing this question, the first being the standard one: treating human rights as inviolable "side-constraints," attempting to maximize the satisfaction (and minimize the infringement) of human rights, and prioritizing the satisfaction of some human rights over others in accordance with a conception of fairness. Ultimately, I conclude that the first approach has serious problems in the case of SRM, while the other two hold more promise. As I will indicate, this issue is not merely a philosophical puzzle. In plausible cases, the first approach is likely to provide little or no action guidance for policy-makers when it comes to SRM. The other two approaches provide a way for policy-makers to take human rights into account when assessing SRM policies, even when it is not possible to fully satisfy all relevant rights.

The standard philosophical model of human rights as side-constraints (Nozick, 1974) would not be friendly to putting rights at risk of infringement, even if one were to do so in service to an admirable cause. On this conception, a person's human rights place limits on the actions others are permitted to take in pursuing their goals, even if those goals themselves are morally good or neutral—hence the *side*-constraining nature of rights. To take an example, we are morally permitted to pursue our own happiness, but not in ways that damage the health of other innocent persons. Their right to health ought to be respected, and this imposes an obligation on

us not to infringe that right. It is usually thought that rights as side-constraints are not the sort of thing that can be weighed against other considerations. On the standard conception, it is not the case that some right-infringement can be balanced and hence justified by a corresponding increase in some other good, even if that good involves promoting other rights. If this is correct, then an SRM policy will be permissible from a human rights perspective only if that policy does not involve the infringement of any human right. But right-infringement might not be avoidable under certain plausible conditions. Imagine the following scenario that could hold in the future:

> The "Dangerous Future" Scenario: Due to insufficient reductions in emissions in the past, humanity is committed to dangerous climate change that will likely outpace its adaptive capacities and thus compromise the human rights of many present and future persons.

It is plausible to think that no climate policy, in such a world, would be able to avoid widespread infringement of human rights. Would we have good reason to prefer some (imperfect) climate policies over others, and if so which types of policy would be preferable?

Answers to these questions depend on what normative framework we use for decision-making, as well as what role human rights are to play in such a framework. Moreover, it is important to consider scenarios like Dangerous Future, given that advocates of researching SRM argue that, although imperfect, SRM deployment may be the best response available in a climate emergency (Keith et al., 2010).[4] To reject SRM simply because it threatens to infringe the rights of some would involve ignoring arguments of this kind.

The standard, "side-constraints" approach prohibiting any right-infringement would be of

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[4] Although worth considering here, arguments from emergency have also been critiqued for various reasons. See Gardiner (2010).

little use in Dangerous Future. If all available policy options would involve right-infringement, and if it is never permissible to adopt a policy that entails such infringement, then no policy option will be permissible. In that case, SRM would be impermissible, but so would every other policy option. On this first approach, we would not be permitted to deploy SRM even if it would result in greatly reduced right-infringement compared to other policies. If consideration of human rights is to be a valuable component of a normative framework for decision-making in scenarios like Dangerous Future, then it must tell us how we are to act in cases in which human rights are likely to be infringed regardless of what we do.

As a second approach, we might aim to minimize the overall magnitude of human right-infringement. Even in Dangerous Future, certain policies may involve much less right-infringement than others, and it is reasonable to hold that we have good moral reason to prefer that policy resulting in the least amount of such infringement. This would be in line with Robert Nozick's notion of a "utilitarianism of rights," for it treats human rights—rather than pleasure or preference-satisfaction—as the good to be maximized. Unlike the first approach, this could permit infringing the rights of some, provided that doing so is necessary in order to achieve the least degree of right-infringement that is possible.

The second approach treats each person's human rights as important but not absolutely inviolable. We might say that it takes rights to constitute *prima facie* side-constraints. Ordinarily these should be respected, but in special cases they may be overridden, such as in a scenario like Dangerous Future. This approach has the advantage of recognizing the moral value of rights, but not to such an extent that it prohibits right-infringement in all cases. In a case in which some right-infringement is unavoidable, this approach might favor SRM, but only if deployment thereof is likely to do better than all other available policies in minimizing overall infringement of human rights.

One potential problem with the second approach is that it does not distinguish among right-holders. Rather, it assumes that all right-holders have equally strong claims on their rights, the infringement of which it then seeks to minimize. But SRM would be a response to a problem for which not all persons are equally responsible. Suppose deployment of SRM in Dangerous Future minimized right infringement, but did so at the cost of infringing the rights of many low emitters. This would be *prima facie* unfair. We might think, for example, that high emitters have a weaker claim to have their climate-relevant rights protected than do low-emitters. Perhaps, then, we should take an approach that weights right-claims differentially. This is not to say that anyone *deserves* to have his or her rights infringed, but only that it is reasonable to prioritize the rights of some in cases in which not everyone's rights can be protected. Although presumably all parties initially have equally strong right-claims, perhaps one can engage in behavior that weakens those claims, such as through high emissions contributing to dangerous climate change.

This suggests a third approach, which introduces considerations of fairness. Following John Broome, I take fairness to involve the proportional satisfaction of claims to some good (Broome, 1990). On this view, some good is fairly distributed if it is allotted according to the strength of various parties' claims upon it. If parties A and B have an equally strong claim on some good, then fairness requires that A and B end up with an equal amount of that good. If A's claim on that good is strong than B's, then fairness requires that A end up with more of that good than B, with how much more being determined by how much stronger A's claim is compared to B's. Now Broome's theory is not meant to apply to rights. Conceived as side-constraints, rights simply ought to be respected. In ordinary cases this seems correct, but in some cases it may be impossible to avoid some right-infringement.

In Dangerous Future, it is reasonable to ask whether some persons have stronger claims

than others when it comes to having their rights protected. In this scenario, the third approach will direct us to adopt a policy that renders fair satisfaction of right-claims, which is to satisfy them in accordance with their strength. At least one plausible determinant of the strength of a climate-relevant right-claim is whether the person in question is responsible to some degree for anthropogenic climate change. All else being equal, someone who has contributed substantially to the problem of climate change will have a weaker claim to have his or her rights protected with respect to climate change than will someone who has not contributed to that problem. Accordingly, some SRM policy will be favored by this approach if deployment thereof is likely to do well in protecting the rights of those least responsible for anthropogenic climate change (e.g., low emitters), even if it does less well in protecting the rights of high emitters.

The first approach is in line with standard ways of thinking about human rights, but it is not helpful in scenarios in which there will be some right-infringement regardless of our policy choices. The second and third approaches are more promising. They allow us to preserve the importance of human rights without being constrained by them in counterproductive ways. The second and third approaches also can provide action-guidance by specifying goals to be achieved, whereas the first approach unhelpfully prohibits all courses of action in Dangerous Future. I do not take a position here on whether the second or third approach is preferable--addressing that would require much more space than I have available--but both are clearly superior to the first approach in such a scenario. This finding is important for policy-makers for at least two reasons. First, it shows that the standard approach to human rights would not be useful in determining whether SRM might be permissible. Second, we have seen that there are alternative approaches to human rights that are plausibly helpful in the case of SRM. Unfortunately, if we reach a point at which SRM deployment is considered a serious option by decision-makers, such as a response to a perceived emergency, averting

right-infringement may be impossible. In that case, if consideration of human rights is to be helpful and action-guiding, we need to appeal to them within some non-standard normative framework.

Climate engineering and climate-induced migration: at the intersection of two emerging policy challenges

Holly Jean Buck

Vulnerable populations should be central to deliberations concerning climate engineering technologies and their uses, as they have less capacity to deal with impacts of both climate engineering and climate change. The rationale for placing vulnerable people at the center of the conversation is primarily normative, but there is also a pragmatic rationale: as David Winickoff and colleagues report from a workshop on climate engineering governance conducted with environmental leaders from developing countries, there is a perception that climate engineering may be a sort of abdication of "moral responsibility", deflecting the climate debt of the Global North (2015). Moral responsibility can be more openly discussed by placing vulnerable people at the center of decision-making, which might make cooperative, durable governance more likely, though care must be taken to keep this from slipping into an instrumental rationale — i.e. paying lip service to the vulnerable without actually helping or including them. Here, I suggest — along with the other authors in this Forum — that a human rights approach can go part of the way to maintaining an honest focus on vulnerable peoples. Human rights provides a framework to better recognize equity and justice issues, and ground laws and political and social structures in moral reasons and moral discourse; it addresses both rights and obligations (Burns, 2016).

If the voices of vulnerable people should be prominent in the climate engineering conversation, this suggests a role for the communities of people who pay attention to climate-induced migration – both migrants and their advocates in expert communities. Right now, climate migration and climate engineering are seen as entirely unconnected issues, and the place of migration within the existing climate regime is fragmented and still developing. However, I focus on migrants here — out of all the peoples mentioned in the Paris Agreement's Preamble, which includes indigenous peoples, local communities, children, and persons with disabilities — because the way in which the climate migration conversation is embracing and advancing a human rights-centered approach provides an interesting model for a rights-centered climate engineering conversation. NGO advocates, migration scholars, international organizations, and others working in climate migration are wrestling with some of the same big questions that are important for a functioning system of climate engineering governance: How are harms attributed? How does policy manage risks that fall predominantly on the least powerful? What kinds of strategic action should be taken in the face of slow-onset disasters? How can the people being impacted be included in decision-making? The experience gleaned here can act as a guide to how to incorporate a perspective grounded in human rights into a nascent climate policy arena. In this section of the Forum, I pull out three main lessons from the climate migration conversation and apply them to climate engineering.

A first step is simply to create capacity at institutions to understand both issues: this means educating people who work in migration about the capacity of various forms of climate engineering to influence movements, and the difficulty of attribution of climatic events to climate engineering. It also means educating people who might be making more technical decisions about climate engineering on the current science and wisdom from practitioners on the ground about climate migration. Ideas of climate migration are constantly evolving. As the concept of

climate migrant becomes mainstreamed in policy circles, there is a shift away from the "climate refugee", towards the migrant— an entrepreneurial individual who is going to make a positive economic contribution, as Bettini observes, with climate migration reframed as a matter of human security (2013, p. 3). The push/pull theory of migration still shapes the discussion, but contemporary migration theory increasingly addresses the web of situations and relations— economic, social, emotional, political, and cultural— underlying the decision to move (Crumley, 2012, p. 25). These relations are difficult to disentangle from environmental factors. Also emergent are important critiques of the "climate refugee" and his or her role in conflict: for example, Hartmann identifies an exceptionalism where people assume scarcity will bring innovation in affluent countries, but the opposite is assumed for poorer people, who are treated as "victims/ villains, incapable of innovation or livelihood diversification and naturally prone to violence". Moreover, focusing on "climate refugees" can "naturalize the economic and political causes of environmental degradation and masks the role of institutional responses to it", argues Hartmann (2010, p. 237). A human-rights centered discourse of climate migration can keep climate migrants from being viewed simply as victims or villains, but as empowered agents who can make positive contributions when structural barriers are not limiting them, and this conception is a good starting point for climate engineering policy that deals with things such as compensation, liability, or development (e.g. for development opportunities related to blue carbon, soil carbon sequestration, and other carbon removal strategies that can affect land and livelihoods).

Secondly, anticipatory planning would be a large part of a human rights-centered climate engineering regime (the following section of this Forum discusses anticipatory planning from a humanitarian perspective). With regards to migration, there are already learning experiences from climate-related migration. Both climate change and climate engineering intersect with

sudden-onset disasters as well as slow-onset deteriorations of climatic conditions, such as desertification, salinisation, and sea-level rise, which affect migration in different ways. For hydrometerological climate-related disasters, schemes for temporary migration can be useful. For example, in response to the 2010-2011 flooding in Colombia, the International Organization for Migration worked with a Spanish agricultural labor union to implement a "Temporary and Circular Labour Migration Project" (TCLM), with some European Union funds. Several thousand who lost their means of subsistence during floods and landslides could go to Spain to work for a time and gain new skills, as well as remittances; this also gave the soil and land a chance to recover from the floods (Rinke, 2012).

However, when it comes to anticipating slow-onset disasters, it is difficult to attribute how much migration pressure comes from climatic factors (and presumably even more difficult to anticipate what stress would come from climate engineering versus climate change). Climate change unfolds at the same time that economies are undergoing structural transformations from agricultural livelihoods to manufacturing, service, or information economies — and as automation replaces both manufacturing and service jobs around the world, it may be even harder to disentangle climatic factors from economic displacement. Large-scale, global, or organized help in relocating or adjusting to these changes might seem at first glance like the social version of climate engineering, the extension of managerial logic— we can refer here to James Scott's work on the "large-scale social engineering" of the ujamaa village campaign in Tanzania, where 5 million people were resettled in the mid-1970s (1998). While previous states were interested in making people sedentary and "legible", the states of tomorrow may be interested in helping their populations be fluid, liquid modern subjects who are still legible due to new mobile technologies. Planning for and accommodating migration carries a spectre of

dystopian high-engineering social planning, but this does not need to be the case: much can and will be done on local levels. But the challenges should be met early and reflexively.

The tendency of coping with these entangled drivers of migration might be to disentangle causality and responsibility through identifying variables like one often does in social science, law, or insurance. For example, in a five-country World Bank study in the Middle East / North Africa region, in the areas most affected by climate change, climate factors may account for 10-20% of the overall level of migration observed today, and "this is likely to increase as climatic conditions continue to deteriorate" (Wodoni and Liverani, 2014, p. xxiv). The accuracy of figuring out the probability of a person being a 25% climate migrant, or a 25% climate engineering migrant and a 30% regular climate change migrant, is debatable — though in a data and algorithm-driven era, this kind of statistical analysis may in fact be a tool for designing policy. But a human rights approach indicates that the distinction between types of migrants might not matter: what matters is the migrants' ability to make a good life, and if climate engineering means taking responsibility for the climate, it may also mean taking responsibility for ensuring environmental conditions in which they can flourish.

The complexity of migration in the twenty-first century may lead policy-makers to bound it off from topics like climate engineering for simplicity's sake, but a climate engineering regime that confronts and integrates topics like migration will be more legitimate and durable. When it comes to anticipatory governance, there is a lot at stake in getting the discourse right: part of why migration is worth considering alongside climate engineering, specifically through a human rights lens, is the very real possibility that migration is used as a justification for pursuing solar radiation management. This justification could be used rhetorically by developed countries who fear an influx of climate migrants from climate disasters or slow-onset catastrophes (e.g. prolonged drought, increasing heat stress, sea level rise), or employed by people within

developing countries who believe it could be a tool to save their communities and remain in place, or considered by regions or nation-states in varying contexts who lack the financial means to adapt coastal cities to sea level rise. In short, the movement of people may turn out to be central to the logic of climate engineering, with politics that could be either xenophobic or progressive depending upon who is at the center of the discussion. If a human rights approach to migration involves placing the migrant at the center of migration governance, with particular attention to disadvantaged or vulnerable groups (OHCHR, 2017), then a human rights approach to climate engineering and migration would also put the migrant at the center of attention. There is an element of "getting out in front" of potential xenophobic or fear-based discourses and climate engineering policies —early on in the governance of climate engineering, there is an opportunity to establish anticipatory governance that already entrenches the rights and concerns of migrants and vulnerable peoples, who are usually the ones who have done the least to cause the climate change problem.

Finally, a third component of treating climate migration and climate engineering together could be to institute a climate migrant protection fund, in case climate engineering has adverse or unexpected impacts. Biermann (2014) has suggested a sui generis regime to protect climate migrants, such as a Climate Migrants Protection Facility within the framework of the Green Climate Fund or Adaptation Fund. Since it seems more likely that solar radiation management would be deployed as a last-ditch resort in a situation of economic distress, and since many pledged climate finance funds have yet failed to fully materialize, it may be over-optimistic to suggest that something similar to this could be instituted, yet it would be a welcome sign of addressing the moral responsibility issue inherent in climate engineering.

In conclusion, migration is just one part of a human-rights focused regime; there are many other rights — including procedural ones about self-determination— that are relevant to

place at the center of a climate engineering regime. The key argument here is that it would be fruitful to look at migration policy and climate engineering policies together, rather than cordoning climate engineering off as a technical matter. As Winickoff et al put it, "Climate engineering policy must be seen as inseparable from the larger policy landscape of climate change, and must therefore include the scientific, moral and political dynamics of greatest concern to the developing world" (2015, 632). Ultimately, integrating these dynamics goes beyond taking lessons from areas like migration and applying them to other pieces of the puzzle; it involves designing institutions that have the capacity to straddle these areas and "institutionalizing inclusion", as Winickoff et al recommend. A human-rights centered framework for climate engineering is one way to clarify and formally ground the rights and obligations towards vulnerable peoples.

What if 'rights' is all that's left in a geoengineered world?: SRM and human rights from a needs-based perspective

Pablo Suarez

As the global climate continues to change, humanitarian organizations are confronting unprecedented challenges, both operationally (i.e. in their ability to anticipate and deal with extreme events and ongoing trends) and in terms of policy (i.e. in their ability to influence the macro-level decisions that shape hazards, vulnerabilities and capacities). Nowadays these organizations generally recognize climate change as a relevant issue for their work, and are involved in initiatives from global policy to community-based adaptation. Yet only a decade or so ago, they largely perceived the climate change issue as distant and unworthy of engagement.

Usually labeled 'global warming', climate change was seen by most humanitarians as belonging to the field of atmospheric chemistry, pertaining to an improbable long-term future of confusing science, sprinkled with occasional news ripples invoking scenarios of remote doom. Geoengineering is now, in the eyes of the humanitarian sector, similar to global warming a decade ago: too complex to fully grasp, and seemingly too distant to be worth engaging in. Meanwhile, proponents of solar radiation management (SRM) and other forms of geoengineering are finding fertile ground, given mounting evidence of the global climate system approaching irreversibly critical thresholds. From research frameworks (Long et al. 2015) to technology development (Keith 2013), a growing cadre of actors is hastening preparations should a plan 'B' be deemed necessary. The future is no longer what it used to be.

Rapidly becoming technically feasible as a "planetary emergency procedure" (Kintisch 2010), the intentional manipulation of the global climate may become politically feasible during our lifetime. As a researcher in climate and disasters turned humanitarian worker, it is natural to think that we must prepare for improbable but plausible future conditions. Since Aristotle, we accept that it is in the very nature of probability that improbable things *will* happen. Consider the scenario posited by Sullivan (1995) when he argued that to the engineer, Murphy's Law represents a statistical truism; "what can go wrong will go wrong". A particular concern is the prospect of "predatory geoengineering" (Suarez and van Aalst, 2016), where recklessly self-concerned actions may result in harmful consequences to others. If deployed, geoengineering can go wrong - and will go wrong in some way, in some place, for some person, community or region who did little or nothing to contribute to either the causes of climate change or to the geoengineering 'solution'.

Of course, similar arguments could be made about the choice of *not* deploying geoengineering. In the context of tipping points or runaway climate change scenarios, SRM

could help reduce impacts on some of the most vulnerable. It is important to note, however, that geoengineering is a humanitarian concern - yet global power dynamics are not set up to ensure that the interests of the most vulnerable are elicited, considered, and addressed in geoengineering deliberations.

Extensive modeling has suggested that one possibility of life in a world with SRM is that rainfall patterns are upset. In the scenario of shifts in precipitation with, versus without SRM, depicted by Caldeira and Wood (2008), [SN1] how would, say, the Gabonese and Congolese Red Cross (and other need-based humanitarian workers) address new food security, shelter, health and other basic needs?   Even with a best-case scenario of net reduction[1] in precipitation and temperature anomalies, SRM deployments are likely to spatially shift some burdens of climate-related impacts, engendering humanitarian externalities-- externalities that governance systems fail to address. A more inclusive and nuanced conversation about what can go wrong - and what must go right – should be informed by the need to internalize potential negative externalities (Suarez et al. 2013).

Because humanitarian implications of climate change will likely be invoked by proponents of geoengineering deployment (see Svoboda, this forum), humanitarian stakeholders will need a framework to prioritize positions and actions that address causes and consequences. The two frameworks that currently shape organizational priorities emerge as potential guiding concepts for humanitarian teams in a geoengineered climate: "Needs-based" and "rights-based". It is crucial for scholars, donors, strategists and practitioners in the humanitarian sector to start thinking about a world where geoengineering discourse and actions shape the needs and also rights of vulnerable people – as well as the institutional landscapes that define what the sector is willing and able to do.

The very few publications addressing humanitarian dimensions of geoengineering

include perspectives on decision scenarios (Suarez et al. 2010), an examination of the perils and potentials of a humanitarian geoengineering regime (Buck 2012), the reasons for engagement of humanitarian organizations in SRM endeavors (Suarez and van Aalst 2016), and a criticism of geoengineeering as an extension of rather than a solution to the problem (Klein 2014). Meanwhile some publications in the humanitarian literature examine potentially radical changes in the sector, such as hypercomplexity in the global hazardscape (Lagadec 2007). The purpose of this opinion piece is to first present the needs-based and rights-based approaches to humanitarian work, and then pose some difficult questions about humanitarian work in a deliberately manipulated climate.

Organizations in the humanitarian sector tend to be guided by one of two divergent approaches. Some are founded on the *needs-based approach*: Where people are in need, help should be provided regardless of any other factors or circumstances. For example, the International Red Cross and Red Crescent Movement, born of a desire to bring assistance without discrimination to the wounded on the battlefield, endeavors to prevent and alleviate human suffering wherever it may be found. Its purpose is to protect life and health and to ensure respect for the human being. Its fundamental principles include impartiality and neutrality, defined as follows:

- Impartiality: the Movement makes no discrimination as to nationality, race, religious beliefs, class, or political opinions. It endeavors to relieve the suffering of individuals, being *guided solely by their needs*, and to give priority to the most urgent cases of distress.

- Neutrality: In order to continue to enjoy the confidence of all, the Movement may not take sides in hostilities or engage at any time in controversies of a political, racial, religious, or ideological nature.'

On the other hand, the *rights-based approach* is embraced by many humanitarian and

development organizations aiming to achieve a positive transformation of power relations among the various actors. There are two stakeholder groups in this approach:

- rights holders: individuals and groups who do not experience full rights

- duty bearers: the institutions obligated to fulfill the holders' rights

Rights-based approaches aim at empowering the rights holders, while strengthening the capacity of duty bearers – or holding them accountable to their obligations. Where needs-based humanitarian organizations tend to focus on problems' immediate causes, rights-based organizations tend to focus on structural causes and their manifestations. To date, no rights-based humanitarian organization has substantially engaged in the field of geoengineering. The Red Cross Red Crescent Climate Centre is following geoengineering developments with concern, and since the Asilomar International Conference on Climate Intervention Technologies in March 2010, frequently articulating humanitarian concerns at SRM events. The prospect of geoengineering poses two key questions:

1. What role, voice or agency will the vulnerable have in geoengineering decisions?

2. Who will pay for humanitarian operations in a geoengineered future?

The first question is best addressed from a rights-based perspective, yet most of the voices proposing to examine the issue have emerged not from rights-based humanitarian organizations but from committed researchers. The relative lack of engagement from rights-based organizations is unfortunate, because this is the time for activist voices in civil society to deploy their know-how, linking geoengineering to many of the basic tenets of rights-based approaches, including accountability, empowerment, participation, non-discrimination and equality.

If the answer to the first question continues to be "no role for the most vulnerable", then the second question is deeply concerning for needs-based organizations. A plausible scenario

of humanitarian crises following SRM deployment poses all sorts of largely unanswerable questions about causation and attribution – likely to reshape the donor landscape. Echoes of the bazaar metaphor come to mind: if geoengineering proponents were to interrupt a runaway climate change trend through SRM deployment, replacing it with a new, deliberately manipulated global climate… Who will 'buy' what breaks? Will current donors in the humanitarian field support new needs for disaster management? Will we relieve the suffering of individuals, *guided solely by their needs*, giving priority to the most urgent cases of distress – regardless of the role that geoengineering may have played in anomalies triggering the observed suffering? Will those who benefit from geoengineering pay for consequent humanitarian operations, regardless of whether they constitute 'normal' disaster management or humanitarian aid directly in response to geoengineering impacts? What if their unfulfilled rights constitute all that is left for the most vulnerable in a geoengineered world gone locally or globally wrong?

The world continues to court catastrophe through inaction on the mitigation and adaptation fronts, while vulnerable populations suffer on the frontlines of climate change. With emerging prospects for geoengineering, some argue we must prepare to deploy - others to do everything we can to prevent it… and in different ways, those options constitute gambling in human lives. At present, from the humanitarian perspective, it is not possible to reliably compare the risks of geoengineering to the risks of unfettered climate change and reach unequivocal conclusions about what future would lead to least suffering, particularly in a scenario of runaway changes and tipping points. While scientists, governance experts and other stakeholders continue to seek answers to the question of likely impacts and how to manage them, it is high time the humanitarian sector starts paying close attention, and examining the relevant links between rights-based and needs-based approaches. A clear identification of right-holders and

duty-bearers can help humanitarian organizations engage in the discourses now shaping responsibilities and decisions, in order to be better prepared to support those in need.

Conclusion

The contributions in this forum have highlighted the challenges of applying a human rights framework to climate engineering: How can society cope with the proliferation of different kinds of rights claims, and what happens when the claims of rights conflict, as Svoboda explores? How can decision-makers deal with conflicting rights and responsibilities when operating under scientific uncertainty — where attributing the causes of climate impacts might be decades delayed, or impossible? As Patrick Taylor Smith has pointed out, a standard the human rights framework offers little help in negotiating burdens and tradeoffs: the strength of human rights claims is that they are inviolable and prioritized, but this makes it difficult to weigh them against one another (2015).

Yet the contributions above have also underscored the potential value of such a human rights approach, despite these inherent difficulties. The human rights framework serves to keep attention on the vulnerable, as well as on responsibility for creating anthropogenic global warming. However, how can this approach be operationalized? One step is to clearly identify right-holders and duty-bearers, as Suarez argues, which can help humanitarian organizations engage in the climate engineering discourse. Another step is to address the needs of the most vulnerable building off of what organizations already have some capacity in doing, be it migration policy or humanitarian work, and put the aspirational documents that already carry some international weight into practice: though climate engineering approaches seem futuristic or emergent, global society is not starting blind with ameliorating climate-related suffering.

At some point, it may be useful to have a formal process that can look at the intersection of climate engineering and human rights, which tackles these first two steps to help identify what governance mechanisms would be needed to preserve human rights if climate engineering was to move forward. This presents serious challenges: it would need to be led by or involve people vulnerable to climate change and climate engineering, and avoid being a legitimation exercise for certain types of research; it also needs to avoid frivolously taking time from people engaged in other important efforts. In the best-case, this process could be a no-regrets effort that also does useful work clarifying and building upon basic issues around climate change adaptation: who are the right-holders and duty-bearers with regards to adaptation? Where is policy around issues such decarbonization in tandem with development or climate-induced migration successful, and where does it fail? Such "basic" research and gathering of expertise, once gathered, could be applied to climate engineering as well to articulate ways of operationalizing a human rights framework.

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[1] Model ouptuts of precipitation changes under climate change, with and without solar radiation management tend to show that, from a global perspective, it may seem preferable to embrace the SRM option (assuming of course that such models capture all relevant feedbacks, delays, thresholds and spatiotemporal shifts in atmospheric behavior that affect the most vulnerable communities, such as seasonality of rainfall for subsistence farmers).

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