Geoengineering and the problem of harm

Martin Bunzl

I am a philosopher. So the only sort of experimentation I engage in is from the comfort of my arm chair — thought experiments. Recently, I have been pondering this thought experiment: Suppose it became necessary to seriously consider geoengineering as a way to cool the planet. Suppose it worked overall, improving the lives of many, but also left some people worse off. Whatever other reservations there might be, would it be fair to proceed on the basis of the numbers — that is, if many more people would benefit from geoengineering than would not?

This is not just a thought experiment. Stephen Schneider, a climatologist at Stanford University in Palo Alto, Calif., pointed out many years ago that geoengineering — the deliberate manipulation of the climate to counteract the effects of global warming — can lower the average temperature of the planet. But the effects will not be the same everywhere, and it will not necessarily offset the local effects of climate change. In fact, some places may be worse off. More recently, Alan Robock, an atmospheric scientist at Rutgers University in New Brunswick, N.J., and his colleagues modeled the effects of injecting sulfur dioxide into the stratosphere to reflect incoming solar radiation back into space and found that in some places climate change plus geoengineering may leave you hotter and drier than climate change alone.

For many people this fact may be enough to kill the whole idea. What "right" do we have to do something that would harm some people? But I think this is a hasty reaction. The same kind of issue arises everyday in more prosaic settings. Suppose you and I live in a village. The majority of villagers want to build a road to get the harvest to market. The only problem is that the road will go through your fields: You will be worse off with the road, but the rest of us will be better off. Should we let the numbers decide? Do we have a right to proceed? Most philosophers would argue we do because we are not interfering with any of your basic freedoms — like speech, movement and the like. Rather, we are interfering with your economic well-being for which we can give you offsetting compensation.

Be that as it may, such a decision ought not to be made lightly. True, the numbers have to support it and compensation has to be fair, but there must also be no other less intrusive alternatives available.

Of course, as of now, we have *no* idea if these conditions would be satisfied in the case of geoengineering. All I claim is this: The possibility that some might be worse off as a result of geoengineering is not a killer objection.

"I object," you yell — after all we are doing philosophy here. "What if building the road or cooling the planet destroys someone's way of life — destroys what makes them *them*?" This is a troubling objection and one that philosophers are not well-equipped to answer. If farming is part of the warp and woof of your life and we force you off the land "for the greater good," then we have strayed into a no man's land between encroaching on basic freedoms and interfering with economic well-being.

So much for the thought experiment. What about doing some real experiments? Here is where a much more serious objection rears its head. You can't tent off a section of the atmosphere, or build a scale model of it, or stick it in a lab. So how can you run an experiment to assess geoengineering's risks and benefits? If you take a very expansive view of what counts as geoengineering, and include planting trees to absorb carbon dioxide or painting our roofs and roads to reflect sunlight, you have no problem. These kinds of interventions can be conducted on a piecemeal basis. But the kind of geoengineering that sets people on edge is much more grandiose than this. It requires intervention on a planetary scale to produce the desired level of cooling. How do you test such proposed interventions before going to "scale"? For something like sulfur aerosols, the most plausible candidate for planetary-scale geoengineering, all you can do is test them at low rates of insertion, look for side effects, and then extrapolate to full-scale insertion. But extrapolate on what basis? Using what mathematical model? I don't say there is no answer here, but we need to know what it is. This seems to me to be the real challenge posed by geoengineering. It is not a matter of ethics; it is a matter of methodology.

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Bunzl is a professor of philosophy at Rutgers University in New Brunswick, N.J., where he directs the Initiative on Climate and Social Policy.