

## Geoengineering: What, how and for whom?

The **Issues and Events** report on the viability of geoengineering to counter global warming did not address the ethical issue. I use the following fable to illustrate the point.

Once upon a time in an idyllic country, near a small town and a farming community, a rope hung out of the sky. One pull on the rope changed the weather from fine and sunny to cloudy and rainy, and the next pull changed it back. For many years the people cooperated; the farmers used the rains to help grow crops, and the townspeople enjoyed the sunny periods. But there came a time when the townspeople protested the rain and wanted more sunshine. The farmers were concerned about their crops. And so arguments broke out, with a person from the town pulling on the rope, followed quickly by a farmer pulling it again, and they pulled and pulled and . . . broke the rope.

Given that the climate is changing because of inadvertent consequences of human activities, the question arises as to whether efforts should be made to deliberately change climate to counteract the warming. Aside from the wisdom and ability to do such a thing economically, the more basic question is the ethical one of who controls the rope. Who makes the decision on behalf of all humanity and other residents of planet Earth to change the climate deliberately?

Climate change is not necessarily bad. The climate has always varied to some degree, and changes have occurred over decades and millennia. Humans and other creatures have adapted to the changes or perished; it is a part of evolution. Changes projected with increased greenhouse gases in the atmosphere may have some aspects that could be regarded as bad; increased heat waves and wildfires in summer, increased and more intense droughts, heavier rains and risk of flooding, stronger storms, decreases in air quality, and increases in bugs and disease are all likely threats. But in some areas, climates improve, high-latitude continents become more equable, growing

seasons are longer, and so on. There are winners and losers. And it is possible to adapt to such changes—at least if the changes occur slowly enough. In other words, key issues are the rate and duration of change, perhaps more so than the nature of the new climate. In that sense, it is the disruptive part of climate change that might be argued as being bad.

Given that climate change is not universally condemned, how can anyone justify deliberately acting to change the climate to benefit any particular group, perhaps even a majority? The ethical questions associated with climate manipulation loom so large that some forms of geoengineering are simply unacceptable. The forms that are acceptable include those that reduce emissions and mitigate the rates of change or reduce the amount of carbon dioxide in the atmosphere. Forms that propose to block sunlight in some fashion, perhaps to emulate a volcanic eruption, would change the hydrological cycle and weather patterns in ways that would be simply unacceptable, even if they were doable. The cost and viability of any such proposals are other major issues, but in my view, they are overwhelmed by the ethical considerations.

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