Ethics and Geoengineering

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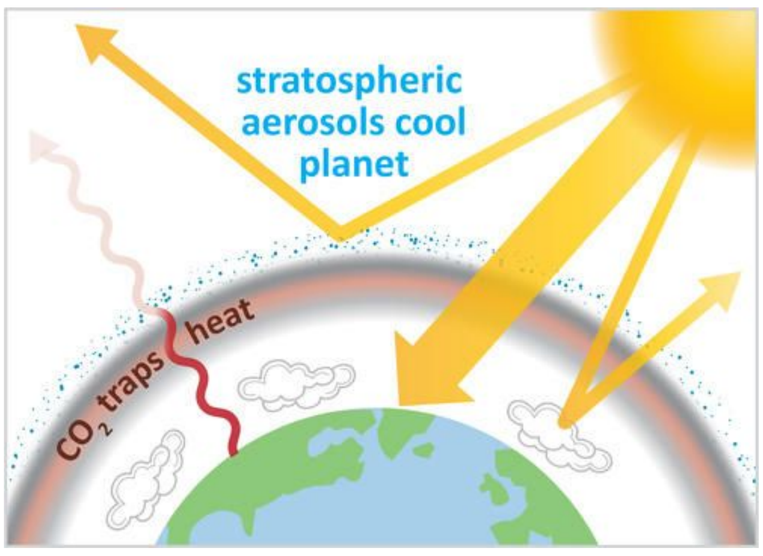
Research Question: What environmental and ethical issues are brought up by geoengineering efforts and is geoengineering an ethical solution to the climate change crisis?

Background

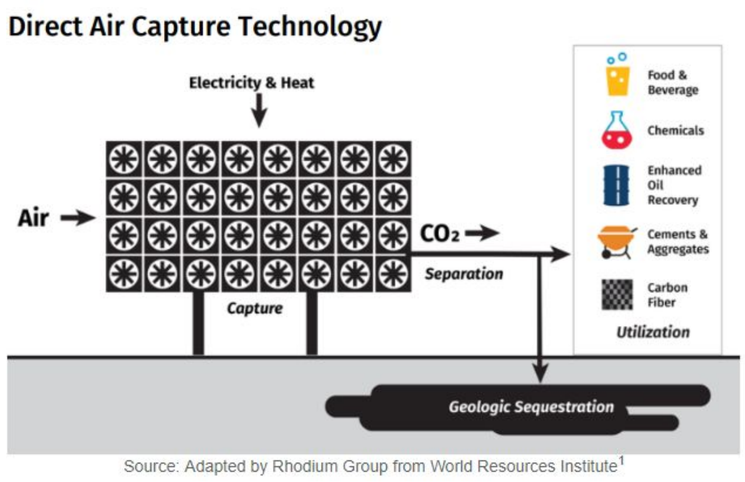
As climate change worsens, drastic efforts are being made to address the problem. One topic that has had a lot of conversation is geoengineering. Geoengineering is the process of changing the atmosphere in an attempt to limit or perhaps reverse some of the impacts of global warming. It is a promising solution to climate change issues but is associated with ethical and environmental concerns that must be discussed.
Geoengineering is a global effort as climate change impacts all nations across the globe, but the issue is that different climates exist and the possible impacts of geoengineering may differ depending on region.
It is important to remember that geoengineering is only in the conceptual stage so the environment and ethical issues are only possibilities.

Types of Geoengineering Methods

- Solar Radiation Management (SRM)
  - SRM aims to cool the planet by reflecting solar rays/energy through various methods such as aerosols injected into clouds or having reflective buildings.
- Carbon Dioxide Removal (CDR)
  - CDR aims to remove carbon dioxide from the atmosphere and store it underground in carbon reservoirs, or purposefully enhancing biota in the ocean to uptake more CO2



This is an image of SRM technology which reflects solar rays from the atmosphere.
https://geoengineering.environment.harvard.edu/geoengineering



Source: Adapted by Rhodium Group from World Resources Institute[1]

Findings

- With SRM technology it would be very difficult for the ecosystems, and plants that depend on natural sunlight levels to receive or be exposed to it.
- Ocean acidification is another big environmental impact
  - If humans used geoengineering to combat global warming with no restrictions on CO_2 emissions, the ocean would continue to acidify, as oceans take about 25% of CO_2 emissions
- Purposeful enhancement of biota can potentially add more carbon to the base of food webs and have adverse effects such as phytoplankton species now being capable of releasing toxins and added CO_2 to the oceans.
- A main ethical concerns is the unequal risk sharing/distribution of benefits.
  - These unequal risk sharing is impacted by disparities in international equity
  - The interests of the most powerful would be protected, while those less powerful will get secondary consideration
- There would need to be an agreement on which nation would control the technology which may not be feasible

Methods

- Research method consisted of a web-based search using secondary sources and scientific articles.
- Focused mainly on articles that discussed the main environmental issues that would arise if geoengineering was implemented.
- Looked at multiple publications from established universities to find the biggest ethical concerns.

Discussion

- As of now geoengineering is not an ethical solution to climate change and, countries should focus on emissions regulations rather than engineering methods/technology, but it is still an option in the future when more research becomes available
- If in turn, geoengineering is not an ethical solution to climate change, resources should be allocated to something that is such as renewable energy
- It is important to discuss this topic now before pouring money into a “solution” that may never work.
- If geoengineering methods were to be implemented this would leaves us with another question, is geoengineering a threat to carbon reduction, as it might give nations and industries the misconception that there is a simpler and less expensive alternative?

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