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HARARE INTERNATIONAL SCHOOL

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ZIMUN XI

The Cost of Innovation:

*Navigating the Ethical Responsibilities of Technological Advancements
and Societal Change for Inclusive, Sustainable Development in a
Globalised World*



*Commission on Science and Technology for Development
Planet B : The Ethics and Implications of Geo-engineering
Interventions in Combating Climate Change*

Committee: Commission on Science and Technology for Development

Issue: Planet B :The Ethics and Implications of Geo-engineering Interventions in Combating Climate Change

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INTRODUCTION

Humanity is facing an existential crisis from climate change , as seen by the rising temperatures, extreme weather phenomena and loss in biodiversity.

In order to combat this Climate Change, researchers, scientists and the UN are looking into different types of geoengineering and are deciding which methods to implement.

Some of these geoengineering methods carry significant risks and may lead to damage or disruption of ecosystems and shifts in the global weather pattern, such as Solar Geoengineering (SRM) and Carbon Dioxide Removal (CDR).

DEFINITION OF KEY TERMS

- Climate Change refers to the alteration of Earth's climate due to changes in the atmosphere. Examples include rise in temperature,icebergs melting and unusual weather phenomena.
- Geoengineering refers to the intentional large-scale manipulation of the Earth's climate system to counteract climate change.
- Cloud-seeding refers to the manipulation of existing clouds to help produce more rain (artificial rain). Artificial Rain is made when clouds are injected with salts such as silver iodide or potassium iodide. These salts act as catalysts allowing water droplets to form in the clouds. These water drops are turned into snowflakes and while falling reach the melting point, turning back to liquid form.

- Solar geoengineering(Solar Radiation Management) involves pumping aerosols into the stratosphere to reflect roughly 1% of total sunlight, leading to the earth cooling down, however SRM is only a temporary solution, as the particles will leave the atmosphere.
- Carbon Dioxide Removal(CDR) involves the extraction of carbon dioxide from other gases in the air by changing it into other forms of carbon through the process of photosynthesis or artificial “scrubbing”. This form of geoengineering can be found in other methods of geoengineering such as ocean fertilization, reforestation and carbon burial.
- Carbon Burial (CCUS) involves pumping pressurized CO₂ gas into suitable geological structures which are buried deep underground, or in the ocean.
- Ocean fertilization refers to the process of dumping nutrients such as iron pellets into the ocean. These nutrients would help phytoplankton grow, which in turn absorb carbon dioxide and through the process of photosynthesis create food.

BACKGROUND ON THE ISSUE

The theory of Climate change was first created in the 1800’s by Joseph Fourier.

Climate change has escalated recently and the largest factor of this is human activities from the industrial period. From the industrial age till now, approximately 2.3 trillion tonnes of greenhouse gases have been released. Most of these greenhouse gases are released from the burning of fossil fuels.

The world as a whole suffers from climate change and entire ecosystems are being altered by climate change.

Other factors affecting climate change include volcanic eruptions, ocean currents, Earth's orbital changes and solar variations.

CURRENT CONTEXT

There have been multiple uses of geoengineering throughout the world in recent times, such as the cloud-seeding done by UAE, USA and Mexico; the Salt Spray used in Australia; Ocean Fertilization in

The warmest decade so far has been the 2014-2023 period, where the temperature globally has been raised by 1.5 degrees Celsius from the pre-industrial period.

There are more extreme weather events such as the wildfires in Australia(2019-2020), Canada(2023), USA(2024-2025), and hurricanes , typhoons, droughts and floods.

MAJOR COUNTRIES AND ORGANIZATION INVOLVED

- The major countries involved in this topic are China, USA, Russia, India, Sweden and Switzerland.
- Countries most affected by climate change include Ethiopia, Kenya, Somalia, India, Japan, Germany and Nigeria. Ethiopia, Kenya and Somalia are affected by floods, whilst Japan is facing high average temperatures with more rain. India and Germany are both suffering from drought, floods and heat waves.
- Organizations that are involved in combating climate change include the Intergovernmental Panel on Climate Change (IPCC), Fridays for Future, Wine to Water, Greenpeace and Emmett Institute on Climate Change and the Environment.
- The IPCC provides scientific assessments on climate change, it's potential future risks and implications to policymakers.

TIMELINE OF KEY EVENTS

- **1978 - ENMOD**
The United Nations implemented the Environmental Modification Convention (ENMOD) whose objective was to deter nations from attempts to militarize geoengineering, such as.
- **2007 - The Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC)**

This report makes a brief allusion to geoengineering as a prospective climate intervention strategy, but asserts the need for caution due to the unknown risks and moral dilemmas at the time.

- **2010 - Convention on Biological Diversity (CBD) COP 10**

Geoengineering was brought up during this convention, which recommended that no climate-related geoengineering efforts occur without global governance, transparency, and scientific reason due to the dangerous nature of geoengineering.

- **2012 - IPCC Fifth Assessment Report**

Geoengineering is discussed in further detail here , where it is divided into two categories: Carbon Dioxide Removal (CDR) and Solar Radiation Management (SRM). It emphasizes how important strong and stringent governance structures are.

- **2015 - The Paris Agreement**

The central goal of this agreement is to reduce the threat of climate change, by keeping the global temperature below 2 degrees Celsius above pre-industrial levels.

- **2017 - Frontiers 2017: Emerging Issues**

- **2023 - the first report on the ethics of climate engineering**

Prior to COP28, UNESCO released this report. It evaluated the hazards and potential associated with climate-manipulating technology. The study makes specific recommendations for governance and research and emphasizes the importance of ethical issues in the creation and potential application of such technology.

RELEVANT UN RESOLUTIONS, TREATIES, & EVENTS

- The UN adopted the Environmental Modification Convention (formerly the Conventions on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD)), which prohibits the use of environmental modification. The treaty was focusing on preventing weather manipulation and other forms of environmental modification in military applications.
- The Paris Agreement which aims to prevent global temperature from rising 2 degrees Celsius above pre-industrial age. —[The Paris Agreement | UNFCCC](#)

PREVIOUS ATTEMPT TO SOLVE THE ISSUE

- Multiple countries have made use of CCUS (Carbon Capture,Utilization & Storage) facilities in order to reduce carbon dioxide emissions.
- Stratospheric aerosol scattering
- Large scale Reforestation
- Cloud-Seeding

POSSIBLE SOLUTIONS

1. Emphasising collaboration of organisations

Organisations such as CSTD and UNEP could collaborate through conferences , in order to promote international cooperation so more advancements can be made in a shorter time frame and reduce inefficiency.

2. The Creation of Geoengineering Subdivision (on a nation-wide scale)

Member states can fund this subdivision in order to create new CCUS facilities which are more advanced due to more money being invested into this subdivision.

3. UN increasing access to CCUS facilities

Requests for the UN to ensure all member states have multiple CCUS facilities, in order to reduce carbon dioxide emissions.

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