



Ethical, Social and Cultural Risks of Climate Engineering

For Prelims: [Climate Engineering](#), [Climate Change](#), [Reflecting Sunlight](#), [Greenhouse Gases](#), [Carbon Dioxide Removal \(CDR\)](#), [Solar Radiation Modification \(SRM\)](#).

For Mains: Fusion of neutron stars and emission of Fast Radio Bursts (FRBs).

Source: DTE

Why in the News?

The [United Nations Educational, Scientific and Cultural Organization \(UNESCO\)](#) in its report on the **Ethics of Climate Engineering** emphasized the importance of including vulnerable, neglected, and **marginalized individuals**, along with women, youth, and indigenous people, as crucial stakeholders in policy decisions regarding the contentious field of [climate engineering](#).

What is Climate Engineering?

- **Climate engineering** refers to the deliberate modification of Earth's climate to counteract or mitigate the effects of [climate change](#).
- This can involve various techniques aimed at either [reflecting sunlight](#) away from the Earth or removing [greenhouse gasses](#) from the atmosphere.
- **Climate engineering techniques** are gaining policy attention due to the current gap between **climate policy targets** and the necessary reductions in atmospheric greenhouse gas concentrations.
- **Climate engineering** is classified into two groups of techniques:
 - **Carbon Dioxide Removal (CDR):**
 - It removes and stores the emitted carbon dioxide from the atmosphere. [CDR](#) involves **five approaches**. This includes:
 - **Direct air capture**
 - **land-use management** through [afforestation / reforestation](#)
 - [Sequestering carbon dioxide \(CO₂\)](#) produced by biomass that may also be used as an energy source increases the uptake of CO₂ by the ocean and enhances natural weathering processes that remove CO₂ from the atmosphere.
 - New **CDR technologies** have performed only about 0.1% of carbon removal around 2.3 million tonnes per year according to a report in the journal Nature.
 - **Solar Radiation Modification (SRM):**
 - **SRM** approaches include increasing the surface reflectivity of the planet
 - Painting structures with reflective paints
 - **Planting crops with high reflectivity**
 - Enhancing the reflectivity of marine clouds
 - Removing **infrared-absorbing clouds**
 - **Injecting aerosols** into the lower stratosphere to mimic the cooling induced by volcanic eruptions and lowering the solar radiation reaching the earth by placing

reflectors or shields in space are some more SRM techniques.

What are the Issues related to Climate Engineering Highlighted in the Report ?

▪ Ethical Issues:

- **Climate engineering methods** may pose a "**moral hazard**" by giving stakeholders a reason to avoid reducing **fossil fuel** use. A comprehensive approach involves considering these techniques as part of a broader portfolio of climate policies, moving away from the moral hazard framework.
- **Climate engineering** faces the issue of "**organized irresponsibility**," where uncertainties and combined environmental risks make it challenging to pinpoint specific institutions responsible for assigning blame. This is because all institutions are interconnected and lack clear individual accountability.

▪ Economical Issues:

- **Climate engineering** could be pushed by corporations as a favored response to tackling global warming while fostering **business investments** and **economic growth**.
- **Deployment of climate engineering technologies** requires international cooperation among countries with different economic interests. It will be a challenge to tailor these technologies to help vulnerable countries while not endangering others.

▪ Governance and Regulation Issues:

- At present, action on **climate change** suffers from a gap between the global approach that it requires and the current nation state-based legal order.
- Climate engineering governance requires a multi-level approach and coordinating with non-state actors. The involvement of such actors can be a source of risk, however, civil society can also play an important role in pressuring institutions to **meet their obligations**, such as through **litigation**.

What are the Recommendations of UNESCO's Report?

- **UNESCO** recommended its Member States to **introduce legislation** that regulates climate action while also considering the **transboundary impact of their decisions** on all human beings and ecosystems.
- Countries should make regional agreements to avoid risks of **unequal spatial distribution of effects**.
- It called for a ban on using **climate engineering techniques** as a weapon (weaponization).
- It added that **political** or **economic** interests should not interfere with **scientific research on climate engineering**.

UPSC Civil Services Examination Previous Year Question (PYQ)

Prelims

Q. In the context of which of the following do some scientists suggest the use of cirrus cloud thinning technique and the injection of sulphate aerosol into stratosphere? (2019)

- (a) Creating the artificial rains in some regions
- (b) Reducing the frequency and intensity of tropical cyclones
- (c) Reducing the adverse effects of solar wind on the Earth
- (d) Reducing the global warming

Ans: (d)

