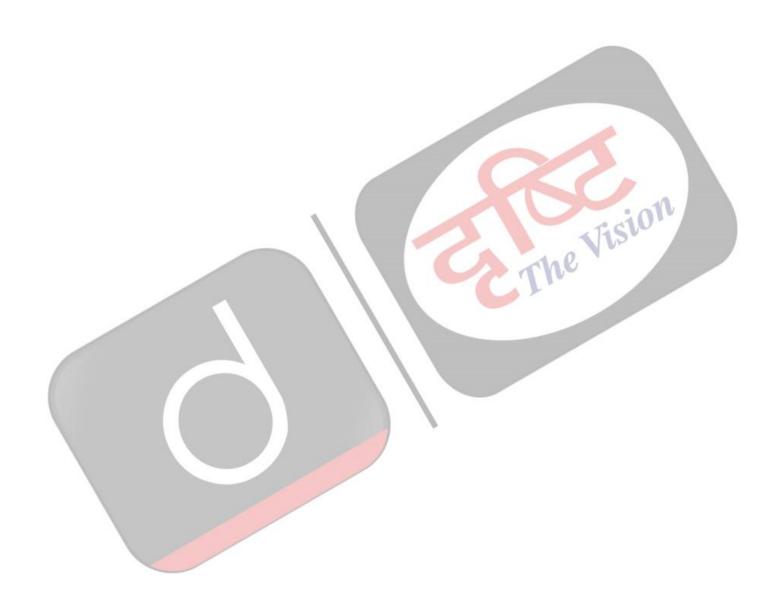


## **Geo-Engineering**



# GEO-ENGINEERING



Geoengineering means manipulating the earth's climate to lower its temperature to counter global warming

#### **TYPES OF GEO-ENGINEERING**

|  | CARBON DIOXIDE  | REMOVAL                                    |   |
|--|---|--|---|
| Technology/<br>Method Proposed                     | Proposed<br>Effects/actions   | Potential<br>Side Effects                  | Feasibility/Cost<br>Effectiveness                                 |
| Land Use<br>Management                             | Afforestation/<br>Reforestation   | Minimum<br>Side Effects                    | High feasibility,<br>Low Cost                                     |
| Bio-energy with carbon capture and storage (BECCS) | Biomass harvested<br>and used as fuel   | Potential land<br>use conflict             | Comparatively expensive   |
| Direct CO <sub>2</sub> Capture                     | Industrial<br>Process   | Minimal                                    | High technical feasibility  |
| Fertilization of the ocean                         | Increased CO2 absorption by promoting algae growth                                | High potential for adverse side effects    | Feasible but not cost-effective                                   |
| Accelerated<br>Weathering                          | Pulverization of silicate rocks   | Potential respiratory<br>health impact     | Could be combined with crop production, a feasible option at scal |
|  | SOLAR RADIATION N   | IANAGEMENT                                 |   |
| Stratospheric<br>aerosol Injection                 | For reflecting sunlight back into space   | Likely impact on<br>the hydrological cycle | Feasible and potentially highly effective                         |
| Marine cloud<br>brightening                        | Seeding of marine clouds<br>with seawater aerosol                                 | Likely impact on precipitation pattern     | Low to medium cost<br>and feasible at scale                       |
| Giant deflectors<br>in outer space                 | Mirror placed in<br>near earth orbit  | Regional climate effects                   | Capital-intensive and long gestation                              |
| Surface albedo<br>approaches                       | Painting the roof of the<br>building bright white,<br>Installing desert reflector | Major Impact on<br>Desert Ecosystem        | High labor and<br>maintenance cost                                |

### REGULATION

(a) No specific international or Indian regulations on geoengineering.

#### INDIA'S EFFORTS

- (y) Department of Science and Technology:
  - Geoengineering climate-modelling research programme (since 2013)

#### (V) IISc:

- Initiative to understand the implications of solar geoengineering for developing countries
- Scientists simulated injecting 20 million tonnes of sulphate aerosols into the Arctic stratosphere



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