

Workshop on Solar Geoengineering Scenario Development

Date: 17th and 18th December 2024

Venue: India Habitat Center, New Delhi, India

Jointly organized by: The Energy and Resources Institute (TERI), The Alliance for Just Deliberation on Solar Geoengineering (DSG), School of Global Policy and Strategy at the University of California and Scripps Institute of Oceanography

Background Note

Climate Context

Climate change has emerged as major global challenge. The world is already starting to see disruptive impacts, with conditions only worsening with time. The atmospheric concentration of greenhouse gases (GHGs) from human activities has increased rapidly. This has subsequently led to cascading impacts like glacial retreat, sea level rise, and extreme weather events like more frequent and more intense cyclones, floods, and droughts. Together these climate impacts leave a larger imprint on societies in terms of the socio-economic devastation.

For the last three decades, countries have been collectively seeking solutions to address climate through negotiated commitments on quantified targets for their respective GHG emissions reductions¹. However, the results of the first Global Stocktake under the Paris Agreement are conclusive that the collective efforts are falling short of achieving the goal of limiting temperature rise to 1.5 degrees Celsius, a target meant to avert the worst climate impacts. Under the current business-as-usual scenario, global mean temperature is set to increase by 2.5 to 2.9 degrees Celsius by the end of the century².

On-going efforts to address climate change focus on reducing GHG emissions, helping adapt to increasing climate impacts, and removing carbon dioxide from the atmosphere. These existing efforts to stabilize global mean temperature within safe limits are not happening fast enough; therefore, new technology proposals that can potentially contribute to limiting harm from climate impacts are now under consideration in various research and policy fora. Solar geoengineering, also known as solar radiation modification (SRM), are a set of technologies that may serve as a complement to decarbonization, adaptation and carbon dioxide removal. These technologies increase the amount of sunlight reflected back into space to cool the planet, and are the fastest known way of bringing global temperature down.

¹ Besides quantified carbon emission targets the climate change negotiations within UNFCCC focuses on adaptation, technology transfer, and financial support.

² UNEP (2023), *Emission Gap Report 2023: Broken Record – Temperatures Hit New Highs, Yet World Fails to Cut Emissions (Again)*, Nairobi: UNEP.

Scientists have started researching SRM as a potential stopgap measure against global warming and there have emerged diverse perspectives on the use of these technologies. Several governments including the United States, United Kingdom, and the European Union, alongside international organizations like the United Nations Environment Programme, are calling for further engagement and research on SRM to answer critical questions about the role these technologies can and cannot play in the climate crisis. The need for research is paramount to better understand the risks and benefits associated with potential future use or nonuse, particularly with reference to regional differences in climate impacts, and mechanisms for effective regulation of research and potential implementation of these technologies. In particular, the dynamic of research and governance is currently heavily skewed towards Global North countries, and more careful engagement with Global South countries is necessary to aid in decision making around these technologies.

SRM in Indian Context

India is a crucial stakeholder in the SRM research and governance space. The country is helping move Global South narratives to the forefront of SRM deliberations, which will deeply affect regional and global decision-making on the subject. Considering Indian and South Asian vulnerability to climate change, and the region's substantial population, understanding Indian perspectives on SRM is extremely necessary.

India's accelerating economic growth, large population and diverse range of geographical landscapes is hampered by climate vulnerabilities, requiring deep consideration of mechanisms to reduce its climate risks. Actively participating in research and governance of SRM not only helps India keep a seat at the table on discussions around these technologies, but also provides India with platforms to build nuanced perspectives among Indian stakeholder to advocate for SRM use or nonuse, in the context of their climate vulnerabilities.

Upcoming SRM Scenario Development Workshop in India

To help build these perspectives and engage in ongoing research, TERI, DSG, and UCSD are launching a *Scenario Development Workshop* that hopes to create multi-disciplinary understanding of how possible SRM deployment will affect climate change in India. The workshop hopes to identify possible challenges associated with research and governance within the Indian context that must ultimately lead to decision-making pathways on SRM.

To that end, this workshop hopes to:

1. Develop, at the national level, understanding of climate change impacts on India and the impacts of various potential SRM responses (Stratospheric Aerosol Injection, Marine Cloud Brightening and Cirrus Cloud Thinning) (Physical Impacts of SRM)
2. Contextualize the uncertainties associated with future decision making on research, governance and potential deployment of SRM, at the national, regional and international levels (Socioeconomic and Political Impacts of SRM)

3. Propose and implement mechanisms for scenarios generation, agenda setting and research initiatives relating to SRM activities

Workshop Structure and Outcomes

The 2-day workshop, to be held in New Delhi on 17-18 December will provide a series of structured lectures to set the stage for participants for further discussions. This knowledge-building phase will be followed by breakout group exercises that will:

1. Define key dimensions of uncertainties associated with SRM technologies deployment
2. Generate several diverse but plausible scenarios for a future where implementation of SRM technologies may occur
3. Articulate storylines for each scenario using the 5 Ws (who, what, when, where and why)

The groups will be asked to determine the driving forces (outside the control of scientific enterprise) that will shape the socioeconomic and political conditions for SRM deployment. Participants will be asked to pay particular attention to produce scenarios that are relevant to the Indian context. These co-produced scenarios would be a novel creation in the solar geoengineering space, leading to new and more India-relevant outcomes for participants. Leveraging these novel co-produced scenario inputs, if feasible, we plan to obtain supercomputing resources to simulate select outcomes in a global climate model and subsequently bring the results back to the original participants to discuss relevant outcomes for future SRM research and decision-making.

Participants

A broad group of approximately 25-30 participants across sectors from India will be invited to the workshop, including civil society organizations from a range of fields (e.g. climate, human rights, democracy), research institutions and universities, public science agencies, meteorological organizations, the private sector (e.g. insurance and finance companies), and sub-regional climate groups.