The climate engineering discourse

United Kingdom: The British Natural Environment Research Council (NERC), together with other organisations, conducted a public dialogue on CE, to provide qualitative insights into public priorities and opinion formation to support future decision-making (NERC 2010). During the dialogue, views on geoengineering became more sophisticated and discriminating. Support for some CE approaches increased, for others declined. Most accepted the potential need for CE in case of ineffective mitigation or combination CE approaches with mitigation efforts.

Germany: As part of the BMBF study, a Delphi expert survey was conducted to improve understanding about the potential for future resistance, protest and conflict (Rickels et al. 2011, Renn et al. 2011). Twelve experts agreed that CE experiments have the potential to engender conflict. Most controversial would be large-scale CE field experiments on developing countries. The Delphi participants expected the greatest conflict potential from high scores for initiatives in or above Germany or against the will of the UN and technologies, the conflict potential increased closer to the deployment site and reached seeding had medium and afforestation low conflict potential. In the case of all atmospheric modification with sulfur particles, followed by ocean fertilization, while cloud seeding had medium and afforestation low conflict potential. In the case of all technologies, the conflict potential increased closer to the deployment site and reached seeding had medium and afforestation low conflict potential. In the case of all technologies, the conflict potential increased closer to the deployment site and reached seeding had medium and afforestation low conflict potential. In the case of all technologies, the conflict potential increased closer to the deployment site and reached seeding had medium and afforestation low conflict potential. In the case of all technologies, the conflict potential increased closer to the deployment site and reached seeding had medium and afforestation low conflict potential. In the case of all technologies, the conflict potential increased closer to the deployment site and reached seeding had medium and afforestation low conflict potential. In the case of all technologies, the conflict potential increased closer to the deployment site and reached seeding had medium and afforestation low conflict potential. In the case of all technologies, the conflict potential increased closer to the deployment site and reached seeding had medium and afforestation low conflict potential.

Possible consequences and risks

Little experience with CE and large-scale CE tests. Study of consequences and risks quite hypothetical yet. Systematic approach to restrain possibilities looks at impact chains and action pathways in certain environments.

Risks: expected loss and probability of events

Consequences: events or sequences induced by CE:
1. Direct impacts on local environments to which CE measures are applied (atmosphere, ocean, water cycle, biodiversity, forests, agriculture, cities).
2. Implications from intended impact on climate system: expected and foreseeable impacts, side-effects, externalities (e.g. cooling or changing rainfall patterns from aerosol emissions, ecosystem change, demographic patterns).
3. Unintended impacts on the climate system: unexpected and unforeseeable side-effects and externalities due to uncertainties and complexities that exceed prediction.
4. Consequences from CE implementation process:
   - CE requires infrastructure and considerable efforts and activities which change natural and social systems
   - Opportunity costs compared to alternative investments
   - Resource competition: need for energy, land, other resources
   - Additional pollution from CE in conflict with environmental law
   - CE implications for climate policy (e.g. blocking mitigation & adaptation strategies)
   - Protests and conflicts at each stage of implementation (anticipation, research, development, testing, deployment).

5. Responses and interactions in the international system:
   - World regions affected differently by climate change and CE
   - Asymmetric distribution of benefits, costs and risks
   - Resistance of States feeling threatened or at disadvantage
   - Security dilemmas, tensions, disruption of cooperation

Framework of multi-stakeholder assessment & management

Literature:


