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Geo-engineering and Biodiversity: An Earth System Law Approach

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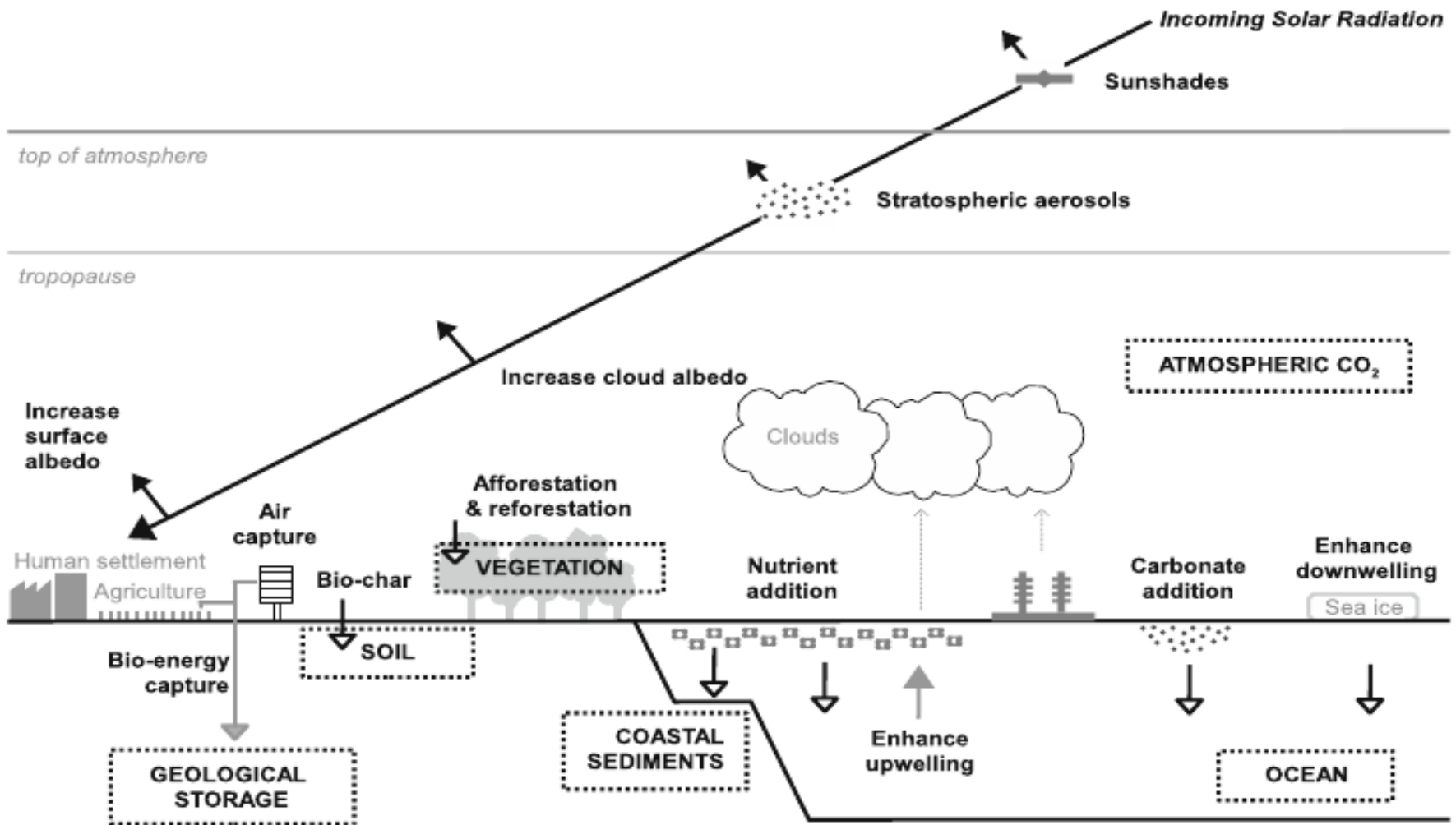
Summary

- Some introductory ideas
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- Risks to be faced by international law instruments
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Introductory ideas

- Current attempts to reduce greenhouse gas emissions remain insufficient to hold global average warming below 2°C above pre-industrial levels. IPCC Special Report on Global Warming of 1.5°C → Claim for action to avoid catastrophic envmtl. Breackdown and extreme poverty.
- Other means of restraining warming, referred to as climate engineering or geoengineering, are being proposed
- Definition of geoengineering: a deliberate intervention in the planetary environment of a nature and scale intended to counteract anthropogenic climate change and its impacts
- Advocates contend that such ideas should be developed as additional measures for the climate change policy toolbox;
- However, some geoengineering techniques and technologies raise concerns relating to their potential transnational environmental and social impacts;
- Climate engineering strategies:
 - Solar Radiation Management (SRM)
 - Carbon Dioxide Removal (CDR)
- Interest from research communities is growing rapidly; but difference between technical and scientific research community / social sciences – legal scholarship

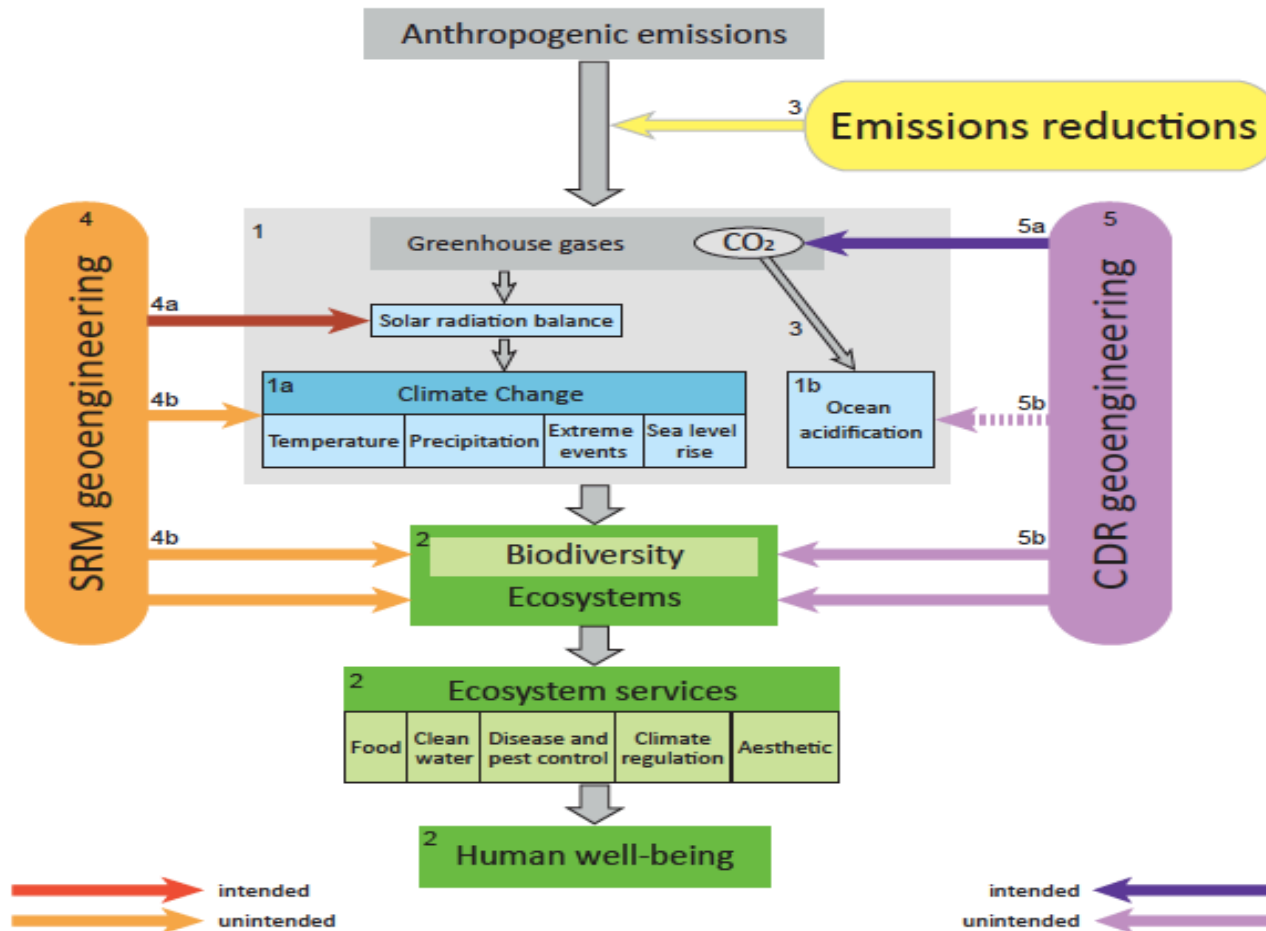
Climate engineering strategies



Source: Vaughan, Naomi E., and Timothy M. Lenton. "A review of climate geoengineering proposals." *Climatic change* 109.3-4 (2011): 745-790

Impact of climate engineering strategies

Figure 2.1. Conceptual overview of how greenhouse-gas emission reductions and the two main groups of geoengineering techniques may affect the climate system, ocean acidification, biodiversity, ecosystem services and human well-being.



Source: Secretariat CBD (2012), Geoengineering in Relation to the Convention of Biological Diversity: Technical and Regulatory Matters, p. 25

Initial assumptions

Geoengineering governance as ‘patchwork’ of regulation provided by multilateral agreements designed for other purposes;

Environmental governance as a complex web of governmental and non-governmental organizations, principles and norms (hard law and soft law) that shape the behaviours of actors seeking to navigate ecological transition in the Anthropocene;

Discussion of **geoengineering in the broader context of Earth System Governance:**

Earth System ← → Earth System Governance

Earth System: a new way of thinking about the Earth, as an integrative meta-science of the whole planet as a integrated, complex, evolving system, beyond a collection of ecosystems or isolated global processes. The new paradigm of Earth System science, which calls for a comprehensive study of the coevolution of geosphere, biosphere and the techno-anthroposphere is linked to a concept that describes a critical ecosystem change: the Anthropocene.

But... As Bierman states, the **Anthropocene is political**. It has to be understood as a global political phenomenon → New role for humankind: from a species that had to adapt to changes in their natural environment to one that has become a driving force in the planetary system.

Earth System Governance: “[...] the sum of the formal and informal rule systems and actor-networks at all levels of human society that are set up in order to influence the co-evolution of human and natural systems in a way that secures the **sustainable development** of human society [...]. Earth system governance covers more than problems of the ‘global commons’ [. .] [it] [...] requires the integration of governance research at all levels. It must bridge scales from global to local” .

Geoengineering and Earth System Governance & Law (ESG-L)

- Geoengineering involves large-scale changes to the global climate and thus cannot be considered in isolation from associated changes in ecosystems and society. ESG is thus well suited to the interrogation of geoengineering governance.
- ESG Research framework (ESG Science and Implementation Plan, November 2018):
 - 4 Contextual conditions: Transformations; Inequality; Anthropocene; Diversity.
 - 5 Research lenses: Architecture & Agency; Democracy & Power; Justice & Allocation; Anticipation & Imagination; Adaptiveness & Reflexivity.
- Earth System Law Issues vis-à-vis ESG research lenses:
 - Nature as *Grundnorm* of Global Constitutionalism
 - The compatibility of institutions (inter and supranational, national, subnational level) responsible for organizing power and legal orders with ecological system.
 - The concept of authority
 - The liability regimes
 - ESL as principles-based law. Need of new legal principles (resilience, eco-systemically evolutive interpretation...)

Geoengineering, ESG and Securitization

- ESG is described as the 'interrelated and increasingly integrated system of formal and informal rules, rule-making systems, and actor-networks at all levels of human society (from local to global) that are set up to steer societies towards preventing, mitigating, and adapting to global and local environmental change and, in particular, earth system transformation, within the normative context of **sustainable development**' (Talberg et al. 2017)
- The "climate as catastrophe" discourse creates a common or "global enemy", **The securitization of climate change serves an important function in recognizing its more diffuse impacts on the political and economic stability of nations** but, more pragmatically, also provides a mechanism for demanding immediate attention from decision makers and the mobilization of additional resources. Karen Scott (2013) : The declaration of "war" on climate change and the deployment of other military metaphors serves a similar function and, moreover, can be used to justify more ambitious or risky measures designed to defeat climate change.
- **Attention:** → Need to go Beyond the narrative of Sustainable Development! Disentangling Sustainability from Development. New normative Context: **Global Constitutionalism of Earth System and Earth System Law** and **Just Transition:** Environmental Justice + Climate Justice + Energy Justice+Ecological Justice + Social Justice

Risks to be faced by international law instruments

- The risks inherent in the use of these technologies have already been raised by a host of international institutions
- Its limited cost may prompt some States with sufficient financial and technological capabilities to try to “solve” the problem of climate change unilaterally
- “Moral hazard” that geoengineering technologies imply since they could undermine already inadequate efforts to mitigate GHG emissions and, to a lesser extent, undercut adaptation actions
- Issues of legitimacy and a serious threat of systemic instability

International legal instruments relevant to geoengineering

- UN Convention on the Law of the Sea (UNCLOS)
- London Convention on the prevention of Marine Pollution by Dumping of Wastes and other Matter & London Protocol (London Convention)
- Convention for the Prevention of Pollution from Ships & Protocols (MARPOL 73/78)
- Convention on Long Range Transboundary Air Pollution & Protocols (CLRTAP)
- Vienna Convention on the Protection of the Ozon Layer
- UN Convention on Climate Change (UNFCCC)
- UN Convention on Biological Diversity (CBD)
- UN Convention to Combat Desertification (UNCCD)
- Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD)
- Antarctic Treaty System (ATS)

International Law principles governing geoengineering

- Principle of *sic utere tuo ut alienum non laedas*
 - Duty of information, notification and negotiation
 - Duty of conducting a prior environmental assessment of activities that might have a significant adverse effect in a transboundary context or on a shared resource (ICJ Pulp Mills 2010; art. 14 of the CBD and CBD COP Decision 2010; LC/LP amendment 2013)
- Precautionary principle
 - ICJ, but mostly indirect appeals
 - Art. 3(3) of the FCCC; art. 3(1) of the LC/LP; CBD COP Decision 2010, specifically in reference to the fertilisation of the oceans, biological diversity and climate change)

Geoengineering and biodiversity conventions

- The CBD cautions against activities that threaten biodiversity and requires prior environmental assessment of activities that might have a significant adverse effect in a transboundary context or on a shared resource (art. 14).
- 2008 COP Decision cautioned precautionary behaviour with regard to ocean fertilization.
- 2010: COP Decision, which states clearly that “no climate-related geo-engineering activities that may affect biodiversity take place, until there is an adequate scientific basis on which to justify such activities and appropriate consideration of the associated risks for the prior environmental assessment of activities that might have a significant adverse effect in a transboundary context or on a shared resource.”
- 2012: COP Decision inviting Parties to address climate engineering research gaps

Geoengineering and climate conventions

- Neither the FCCC nor the KP nor the PA has explicitly addressed the regulation of geoengineering
- FCCC: Art. 4 points to general mitigation activities, including the protection and improvement of sinks and reservoirs, but it does not allow deducing any prohibition or authorisation relating to the use of geoengineering to stabilise GHG emissions.
- KP: Fails to mention geoengineering. In 2011, however, carbon capture and sequestration were included as a component of BECCS within the CDM.
- PA: Art. 4 (1) does not prevent the inclusion of CO₂ removal by means of geoengineering among the accepted mitigation activities. It acknowledges the central role of anthropogenic removal by sinks to attain its objectives and includes climate policy that would permit the use of geoengineering.

Geoengineering and marine conventions

- UNCLOS establishes the legal framework that governs all activities on the oceans and seas, including the activities of marine geoengineering:
 - Extent to which the geoengineering technologies are covered by the Convention’s notion of pollution or its ban on dumping (included under art. 1(4, 5)? Excluded under art. 1(5, b, ii)?)
 - Part XII of UNCLOS may not contain specific rules on the subject, but it does lay out basic principles (art. 192-195)
 - Reference to “rules and standards” of a global and regional nature in art. 210(4, 6) & 216:
 - London Convention/London Protocol (LC/LP), amendments 2008, 2010, 2013)

Geoengineering and marine conventions

- LC/LP: risk of forum shopping and of systemic rift
 - Resolution LP.4(8) Amendment to the London Protocol to regulate the placement of matter for ocean fertilization and other marine geoengineering activities (2013, not in force)
 - Two new annexes: list of regulated marine geoengineering activities (ocean fertilization) and assessment framework with risk management and monitoring
 - Resolution LC-LP.2(2010) on the assessment framework for scientific research involving ocean fertilization (2010)
 - Assessing ocean fertilization research proposals and completing environmental assessment with risk management and monitoring
 - Resolution LP.3(4) on the amendment to article 6 of the London Protocol (2009, not in force) allowing export of carbon dioxide streams for disposal
 - Resolution LC-LP.1 (2008) on the regulation of ocean fertilization (2008):
 - Allows ocean fertilization activities for scientific research
 - Resolution LP.1(1) on the Amendment to include the sequestration of carbon dioxide streams in sub-seabed geological formations in Annex 1 to the London Protocol (2006)

Final remarks

The role of legal principles in international geoengineering governance:

Tension between Precautionary Principle -- Harm Minimisation Principle

... maybe those principles play at different stages: Research (HM) – Deployment (P).
Even if several times it is difficult to distinguish between R&D

Anthropocene can be read through its “human makers”. Among many proofs of that, climate change emerges as a “super wretched problem” and it is inevitably that many times the expectation in achieving a “good Anthropocene” is associated with the progress of new technologies.

...but what norms define the legal framework and who governs geoengineering?

Actual geoengineering governance situation:

- Governance-by-default (transitory and reactive)
- Scientist as *de facto* governors (technological rationality, remember A. Hornborg).
On the contrary legal scholarship may contribute to improving legitimacy, justice and the effectiveness of the activities of international and transnational institutions working into the net of global governance (A. von Bogdandy et al.).
- The ESG should be underpinned by the normative framework of Global Constitutionalism and Earth System Law, in order to address a “just transition” towards a more democratic world society, with an economy free of CO₂ emissions, reducing inequalities and risks on the Earth System.