

Environmental Principles and Geo-engineering

by

Professor Mikis Tsimplis

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Environmental principles and geo- engineering

Background

- 1992 Rio Convention
- 1997 Kyoto Protocol
 - GHG reduction for developed states
 - Period of GHG control ends 2012
- The post-Kyoto processes is progressing very slowly or it is dead
- Copenhagen Accord
 - Voluntary scheme
- Major problems
 - No graduation scheme
 - Money go to most developed of developing countries
 - Targets of GHG concentrations not useful for some states
 - Treatment of reduction in GHG from land use and land use change, alternative energy etc.

Rationale for geo-engineering solutions

- Reductions needed are probably in excess of 70% for developed states
- Development takes priority for many developing states
- Nuclear energy is probably too risky if deployed globally
- Taking out GHG or reducing incoming radiation are options that are explored
 - What are the risks?
 - Who can decide whether to go ahead?
 - What will happen if other states suffer damages due to these?
 - Are they socially permissible?

Geo-engineering solutions

- Reduce incoming radiation (Solar Radiation Management)
 - Spraying of Sulfate Aerosols Into The Atmosphere
 - Bio-engineering crops to be a lighter colour to reflect sunlight; an
 - Mirrors in space
 - Suppressing cirrus clouds.
- Increase CO₂ absorption (Carbon Dioxide Removal)
 - Trap CO₂ in Carbon Scrubbers
 - Fertilizing Trees With Nitrogen
 - Aerial Reforestation
 - Ocean Iron Fertilization (almost ruled out)
 - Enrich Soils With Biochar

Natural release of CO₂

- Massive carbon dioxide gas (CO₂) release kill
- Lakes Nyos – Cameroon (1986) 1800 people killed
- Lake Monoun Cameroon (1984) 37 killed
- Lake Kivu in East Africa (a third lake)
- Very rare incident



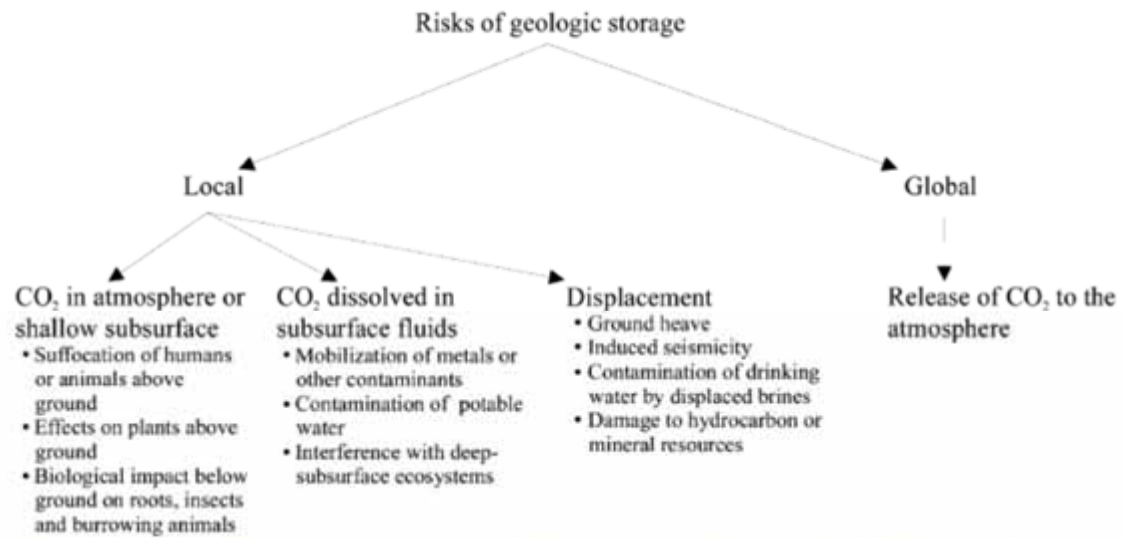


FIGURE 1. Taxonomy of risks of geologic sequestration. The risks fall in two categories: local environmental risks and global risk arising from leaks that return stored CO₂ to the atmosphere. The global risk may alternatively be viewed as uncertainty in the effectiveness of CO₂ containment. Local health, safety, and environmental risks arise from three processes: the elevated CO₂ concentrations associated with the flux of CO₂ through the shallow subsurface to the atmosphere, the chemical effects of dissolved CO₂ in the subsurface, and the effects that arise from the displacement of fluids by the injected CO₂.

International law

- Sources of International Law
 - Treaties
 - Customary International Law
 - Decisions of the Int. Court of Justice
- Types of International Law
 - “Hard law”
 - “Soft law”
- Principles of Environmental law
 - The Stockholm Declaration 1972
 - The Rio Declaration 1992

The Environment as an Essential State Interest

- The Court has no difficulty in acknowledging that the concerns expressed by Hungary for its natural environment in the region ... related to an "essential interest" of that State...
(p.41)
 - Gabčíkovo-Nagymaros Project, ICJ

What is “the environment”?

- "the environment is not an abstraction but represents the living space, the quality of life and the very health of human beings, including generations unborn. The existence of the general obligation of States to ensure that activities within their jurisdiction and control respect the environment of other States or of areas beyond national control is now part of the corpus of international law relating to the environment." (*Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, I. C. J. Reports 1996*, pp. 241 -242, para. 29.)

LOSC 1982

- Art1. (4) "pollution of the marine environment" means the introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries, which results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities;

LOSC 1982

- Art. 192
 - States have the obligation to protect and preserve the marine environment.
- Art. 193
 - States have the sovereign right to exploit their natural resources pursuant to their environmental policies and in accordance with their duty to protect and preserve the marine environment.

Principles of Environmental Law

- Sovereignty over territory
- Right to exploit resources
- No Harm Principle
- Prevention Principle
- Good neighbourliness and international co-operation
- Polluter Pays Principle
- Precautionary Principle
- Inter-Generational Equity
- Common but differentiated responsibility

How will these work in a geo-engineering project?

- National Impacts
 - National/EC laws
 - Environmental liability
- International impacts
 - International law
 - Environmental principles
- Environmental Impact Assessment

Geo-engineering Governance

- Territory
 - Each state has exclusive rights
 - No harm principle (transboundary)
 - Possibility of liability
- Sea
 - Territorial sea
 - Continental Shelf
 - The Area
- GHG
 - As wastes
 - As pollutants

Storage of CO₂ at the seabed

- Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 (London Convention)
- 1996 London Protocol
 - Amended on 2 November 2006
 - Permit the sequestration of CO₂ streams from CO₂ capture processes in sub-seabed geological formations
- OSPAR Convention amended accordingly

Issues that need to be resolved for every geo-engineering solution

- Is the method contained in one state?
- If yes: then law of that state alone determines feasibility
 - International obligations
 - National regulations and standards
 - Property rights (subsurface)
 - Liability (long term and operational)
 - This needs to be internalised in the costs
- If no: International law + law of all states involved
 - International obligations
 - Transboundary pollution
 - International regulations
 - Liability
- Public perception
 - Basis for law development