UN BIODIVERSITY CONFERENCE
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MAINSTREAMING BIODIVERSITY FOR WELL-BEING

Geoengineering

Climate change is increasingly becoming an important driver of biodiversity loss and degradation of ecosystem services. A rapid transition to a low-carbon economy is the first priority to reduce greenhouse gas emissions and in turn reduce the adverse impacts of climate change, including impacts on biodiversity. However, given the current atmospheric greenhouse-gas concentrations, their long atmospheric residence times and the relatively limited action to date to reduce future emissions, the use of geoengineering techniques has been suggested and is being explored as a potential additional means to limit the magnitude of climate change.

Climate-related geoengineering can be defined as a deliberate intervention in the planetary environment of a nature and scale intended to counteract anthropogenic climate change and its impacts. Geoengineering techniques include increasing the reflectivity of the Earth's surface or atmosphere, and removing greenhouse gases from the atmosphere; other approaches have also been proposed. This definition of geoengineering encompasses a wide spectrum of possible actions to counteract (or remedy) global warming and its associated consequences.

Such techniques have generated much discussion on their actual effectiveness and safety, and have also raised concerns over their potential impacts on biodiversity and other environmental consequences, as well as the lack of mechanisms for their governance.

Work of the Convention on Biodiversity

The Conference of the Parties (COP) of the Convention on Biological Diversity (CBD) first turned its attention to geoengineering at its ninth meeting in 2008, in the context of ocean fertilization. The COP then requested Parties to ensure that ocean fertilization activities do not take place until there is an adequate scientific basis on which to justify such activities. In response to this request, the Secretariat prepared a synthesis and analysis of the impacts of ocean fertilization on marine biodiversity, which was published as CBD Technical Series 45.
At its tenth meeting in 2010, geoengineering was considered by the COP more generally. Decision X/33, which includes a section on climate-related geoengineering, called for studies on the possible impacts of geoengineering techniques on biodiversity and associated social, economic and cultural considerations, and on gaps in the regulatory mechanisms for climate-related geoengineering relevant to the CBD.
The studies are published in CBD Technical Series No. 66 - Geoengineering in Relation to the Convention on Biological Diversity: Technical and Regulatory Matters (2012).

The COP, at its eleventh meeting in 2012, noted the key findings contained in the reports:

- that there is no single geoengineering approach that currently meets basic criteria for effectiveness, safety and affordability, and that approaches may prove difficult to deploy or govern (XI/20, paragraph 6);
- that there remain significant gaps in the understanding of the impacts of climate-related geoengineering on biodiversity (XI/20, paragraph 7); and
- the lack of science-based, global, transparent and effective control and regulatory mechanisms for climate-related geoengineering, the need for a precautionary approach, and that such mechanisms may be most necessary for those geoengineering activities that have a potential to cause significant adverse transboundary

effects, and those deployed in areas beyond national jurisdiction and the atmosphere, noting that there is no common understanding on where such mechanisms would be best placed (XI/20, paragraph 8).

The COP also requested the Executive Secretary to prepare an update on the potential impacts of geoengineering techniques on biodiversity, and on the regulatory framework of climate-related geoengineering relevant to the CBD, drawing upon all relevant scientific reports such as the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.

The update was prepared for the consideration of the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) at its nineteenth meeting and was then published in October 2016 as CBD Technical Series No. 84 - Update on climate geoengineering in relation to the Convention on Biological Diversity: Potential impacts and regulatory framework.

Twenty-seven key messages are presented in the report, relating to the effectiveness, potential impacts, and current governance mechanisms for both greenhouse gas removal ('negative emissions') and sunlight reflection methods ('solar radiation management'), with focus on possible environmental consequences.

The report is particularly relevant in the context of the Paris Agreement. A key requirement of the Paris Agreement is to balance the global sources and removals of greenhouse gases in the second half of this century, with implicit need for active extraction of carbon dioxide or other greenhouse gases from the atmosphere. Most of the low emission scenarios developed by the Intergovernmental Panel on Climate Change assume a major expansion of bioenergy linked to carbon capture and storage. The update report concludes that the feasibility, effectiveness and impacts of that method, and other carbon removal techniques, are highly uncertain, and that their potential consequences for biodiversity warrant further scientific attention.

Geonengineering at COP13

The Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA), at its nineteenth meeting, considered the update on climate geoengineering in relation to the CBD and adopted recommendation XIX/7, which reaffirms and recalls previous decisions on climate-related geoengineering and notes, among others, that more transdisciplinary research and sharing of knowledge among appropriate institutions is needed in order to better understand the impacts of climate-related geoengineering on biodiversity and ecosystem functions and services, socio-economic, cultural and ethical issues and regulatory options. This recommendation which will be considered by the Conference of the Parties at its thirteenth meetings.

Important links

Convention on Biological Diversity: www.cbd.int
CBD Technical Series No. 66: Geoengineering in Relation to the Convention on Biological Diversity: Technical and Regulatory Matters: https://www.cbd.int/doc/publications/cbd-ts-66-en.pdf
CBD Technical Series No. 84: Update on climate geoengineering in relation to the Convention on Biological Diversity: Potential impacts and regulatory framework: https://www.cbd.int/doc/publications/cbd-ts-84-en.pdf
CBD Technical Series No. 45: Scientific Synthesis of the Impacts of Ocean Fertilization on Marine Biodiversity: https://www.cbd.int/doc/publications/cbd-ts-45-en.pdf
Climate-related geoengineering and biodiversity: https://www.cbd.int/climate/geoengineering/
Aichi Biodiversity Targets: www.cbd.int/sp/targets
Global Biodiversity Outlook 4: www.cbd.int/gbo4

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