

## Contested Natures: Saving biodiversity and the climate with "natural climate solutions"?

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## **Climate Change and Land**

An IPCC Special Report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems

(Summary for Policymakers)







The global assessment report on BIODIVERSITY ND ECOSYSTEM SERVICES

SUMMARY FOR POLICYMAKERS





INTERGOVERNMENTAL PANEL ON CLIMATE CHARGE

## **Global Warming of 1.5°C**

An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty







### Global total net CO2 emissions

Billion tonnes of CO<sub>2</sub>/yr

50 -

40

30

20

10

0

-10

-20

2010

2020

2030

2040

## Paris Agreement ushers in net-zero

## **3 problems with net-zero targets**

- Compensating ongoing fossil fuel emissions via terrestrial sinks increases cumulative emissions
- Potential for mitigation delay increases cumulative emissions
- Over-reliance on land-based CDR (including "natural climate solutions") threatens biodiversity and food security

2060

2070

2090

100

#### Paris Agreement Art. 4.1

"...achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century, on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty"

Source: IPCC SR1.5 SPM



## Cumulative CO2 emissions drive warming

Net-zero goals that allow ongoing fossil fuel emissions add to the active carbon cycle in aggregate







# Mitigation delay increases warming



Faster emission reductions limit cumulative CO2



# Delay requires greater removals

### Breakdown of contributions to global net CO<sub>2</sub> emissions in four illustrative model pathways



Source: IPC SR1.5 SPM

IPCC SR1.5 mitigation pathways rely on land

# Most of the planet's land is used by humans

THE UNIVERSITY OF



Guardian graphic. Source: IPCC SR1.5. Percentage ice-free land not shown.



# Biodiversity projected to decline in IPCC mitigation scenarios



Change between 2015 and 2050



Biodiversity impacts from land use and climate change under a sub-set mitigation scenarios (SSP 1, 2 and 3).





#### **Climate Change**

- Major driver of change in nature, with strong direct global impacts. Examples of climate change impacts on nature include sea-level rise and ocean acidification.
- Average global temperature increase passed 1°C in 2015.
- Increasingly exacerbates the impact of other drivers to biodiversity loss.
- Extinction risk is predicted to increase 3-fold at 3°C warming, increasing further for higher warming levels.

#### **Invasive species**

- Negatively impacts native species, ecosystem function and services, economies and human health.
- Increase of 40% in cumulative records since 1980, 20% of the earth surface at risk.
- No substantial impact on other drivers.
- Trade, travel, habitat degradation and climate change exacerbate invasions.



#### Changes in land and sea-use

- Agricultural expansion is the most widespread form of land-use change, mostly at the expense of old-growth forests, wetlands and grasslands.
- Land degradation is occurring in all land cover, landuse and landscape types, in all countries, with the largest relative negative impact on terrestrial and freshwater ecosystems since 1970.
- · Land-use change is a major contributor to climate change.
- Intensive land use can lead to progressive changes in ecosystem function resulting in land abandonment.

#### **Resource extraction**

- Direct exploitation of living and non-living materials, via harvesting, logging, hunting and fishing, mining and freshwater withdrawals.
- Depletion of water resources interacts with many biophysical and societal drivers, contributing to negative impacts on nature and societies.
- Cascading effects of extraction can manifest as biodiversity losses and accelerated changes in climate, most prominently in tropical forests, marine, coastal and polar ecosystems.
- · Overexploitation undermines ecosystem function.

# 5 direct drivers to biodiversity loss



#### Pollution

 Strong negative effects on quality of soil, water, and the global atmosphere due to pollutants from industrial, mining and agriculture, oil spills and toxic dumping, and underwater noises from shipping.

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- Air, water and soil pollution continue to increase in some areas. Nitrogen emissions several orders of magnitude larger than pre-industrial times, acidifying freshwater ecosystems.
- · No substantial impact on other drivers.
- Transport expansion exacerbates pollution.





Assessment of CDR options against the direct drivers ofbiodiversity OSS

"nature based solutions"?



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Source: Dooley et al. 2020. Carbon-dioxide Removal and Biodiversity: A Threat Identification Framework. Global Policy, doi: 10.1111/1758-5899.12828



- > Separate targets for emissions and removals
- Firewall no fungibility between fossil and biotic carbon
- Regeneration and restoration of natural ecosystems to meet climate, biodiversity and sustainable development objectives
- > Respecting rights: collectively managed areas overlap with intact natural landscapes





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## Thank you

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