ADJUSTING LAND MITIGATION PATHWAYS IMPROVES THE ASSESSMENT OF GLOBAL CLIMATE PROGRESS

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G Grassi, E Stehfest, J Rogelj, D van Vuuren, A Cescatti, J House, G-J Nabuurs, S Rossi, R Alkama, R Abad Viñas, K Calvin, G Ceccherini, S Federici, S Fujimori, M Gusti, T Hasegawa, P Havlik, F Humpenöder, A Korosuo, L Perugini, F Tubiello, A Popp. Critical adjustment of land mitigation pathways for assessing countries' climate progress. Nature CC, 2021. https://rdcu.be/cjq78

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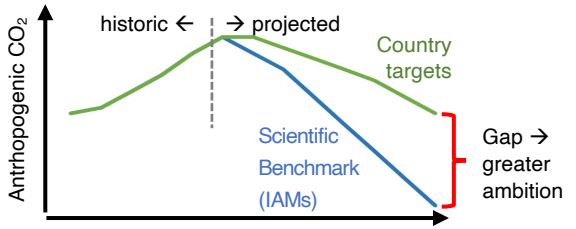
The context

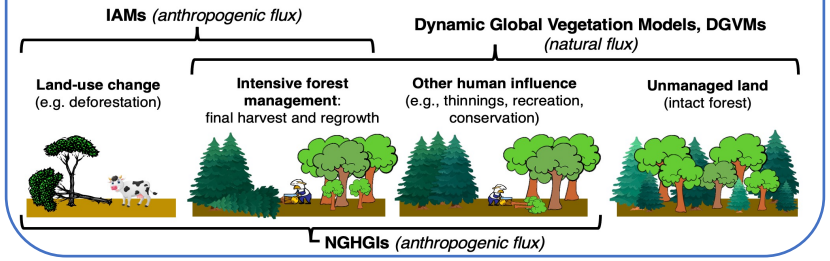
Holding global warming to *well below 2°C* requires economy-wide efforts to reach a balance between *anthropogenic* GHG emissions and removals → Collective progress is assessed by the Global Stocktake (GST) in the light of the best available science (e.g. emissions pathways by Integrated Assessment Models, **IAMs**)

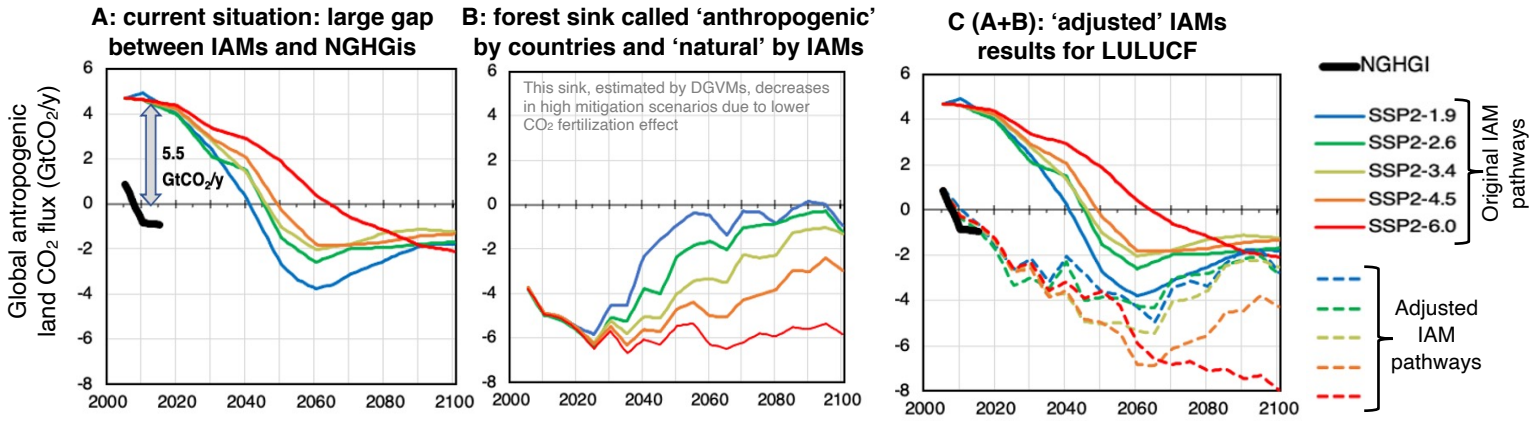


The problem

A large gap (5.5 $GtCO_2$/y, panel **A** below) on anthropogenic land CO_2 flux between IAMs and National GHG inventories (**NGHGIs**) **hampers an accurate assessment of collective climate progress**

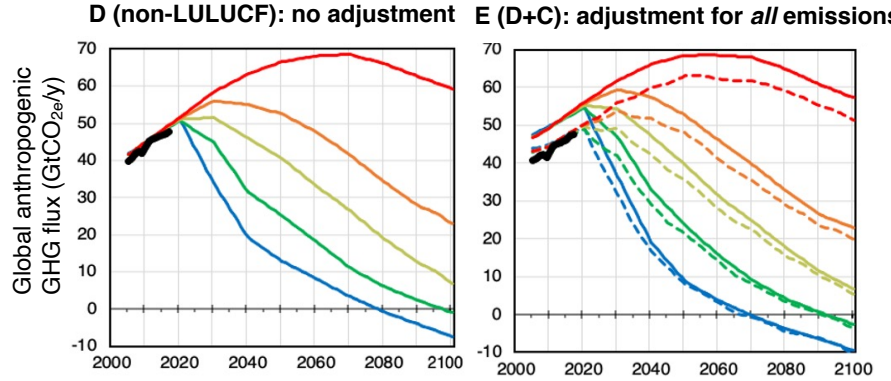
Why this huge gap? Different communities have developed different approaches to identify the *anthropogenic forest CO_2 sink*. It's mostly a labelling issue: countries consider 'anthropogenic' part of what models consider 'natural'.





The solution

We add the modeled forest sink considered 'anthropogenic' by countries (panel **B**) to IAMs' results (panel **C**). The resulting **adjusted IAMs' results become comparable with NGHGIs**.



Pragmatic short-term fix **to ensure comparability between IAMs and countries at the GST**

Adjustment of cumulated IAM fluxes from 2021 until GHG neutrality or 2100

	Gt CO_2	% of original remaining GHG budget
SSP2-1.9	-120	-13%
SSP2-2.6	-192	-12%
SSP2-3.4	-275	-11%
SSP2-4.5	-366	-10%
SSP2-6.0	-475	-9%

Impact on the remaining GHG budget 'understood' by countries

Implications

While non-LULUCF pathways are not affected (panel **D**), our adjustments shifts downwards the current economy-wide emissions and the future pathways (panel **E**). As a result, also the **remaining global GHG budget 'understood' by countries is reduced** compared to original IAMs' estimates (table) → to be taken into account when assessing collective progress towards the Paris Agreement.