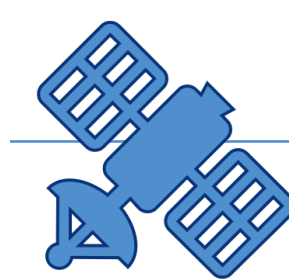


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Why use Earth Observation (EO) derived approaches for carbon flux estimates?

- Support National GHG inventories (NGHGs): Data, uncertainties, gaps verification, credibility.
- Support country comparability and model/NGHG reconciliation for the Global Stocktake.



MANAGED LAND GAP

Methodology-specific approaches to distinguish managed and unmanaged land result in different **areas of forest** and **processes** considered for *anthropogenic* fluxes

Satellite EO approaches capture BOTH managed and unmanaged forest lands

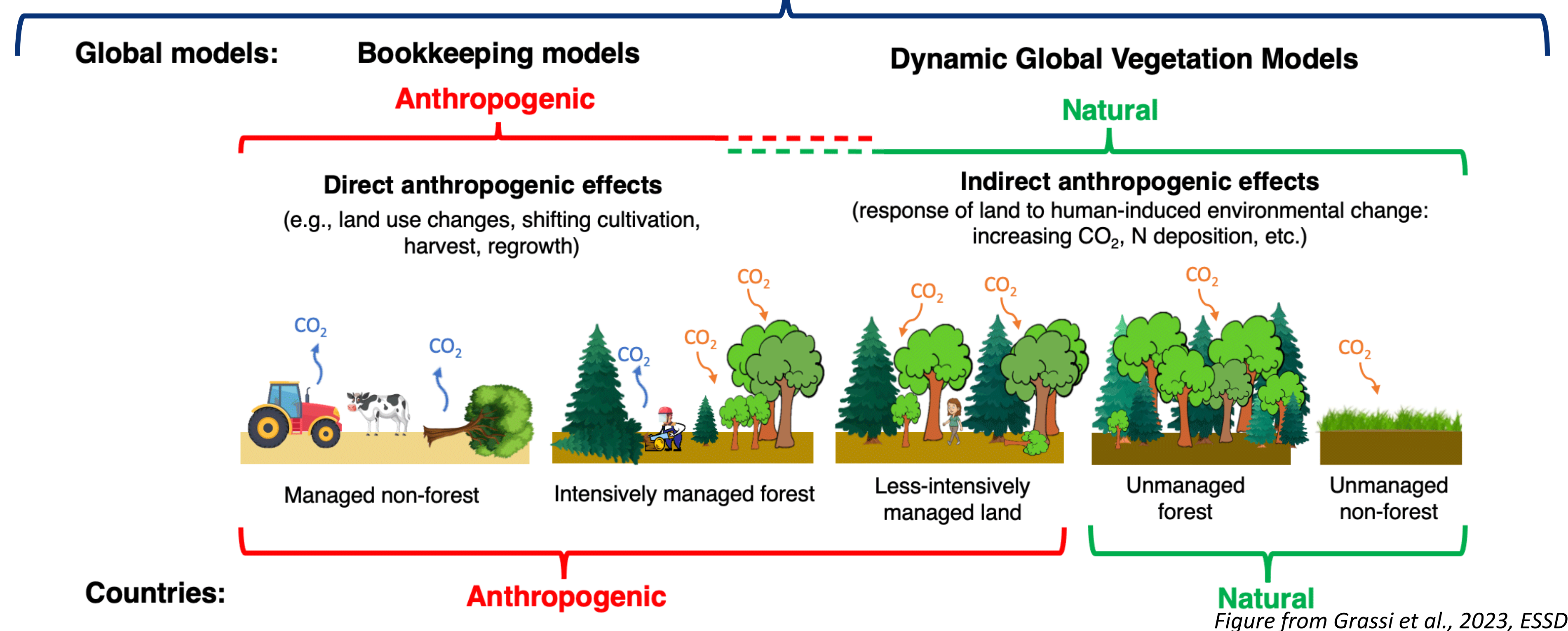
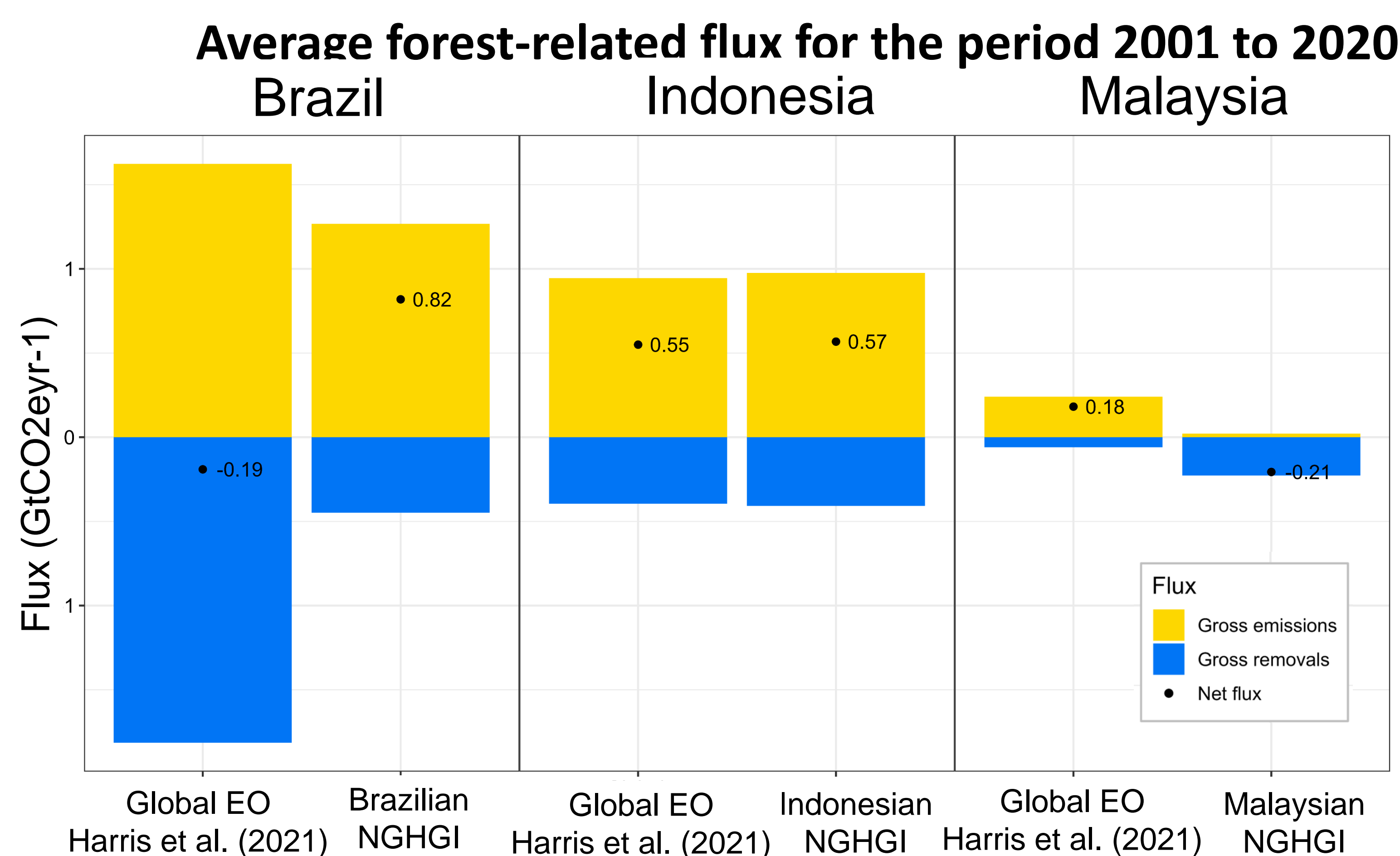


Figure from Grassi et al., 2023, ESSD

MIND THE GAP

Using three case study countries, we can observe the **difference in forest carbon fluxes** as estimated from a Global EO dataset and their National Greenhouse Gas Inventory (NGHGI).



| Features observed | Brazil | Indonesia | Malaysia |
|---|--------|-----------|----------|
| Gap between datasets? | ✓ | ✗ | ✓ |
| Access to forest mask of NGHGI? | ✓ | ✗ | ✗ |
| Information on emission/removal factors available in NGHGI? | ✓ | ✗ | ✓ |
| Can we reconcile the gap? | ✓ | ✗ | ✗ |

Figure adapted from Heinrich et al., 2023, Carbon Balance Manage.

RECONCILING THE GAP

Brazil:

- We can almost **fully reconcile** the difference between approaches by using the NGHGI **managed forest mask** and considering the same **assumptions** as the NGHGs.
- Remaining gaps due to different (i) **removal factors** (ii) **proportions of forest types**.

Such detailed analysis is **not possible in all countries** due to **lack in transparency** of some NGHGs.

Average forest-related flux for the period 2001 to 2020

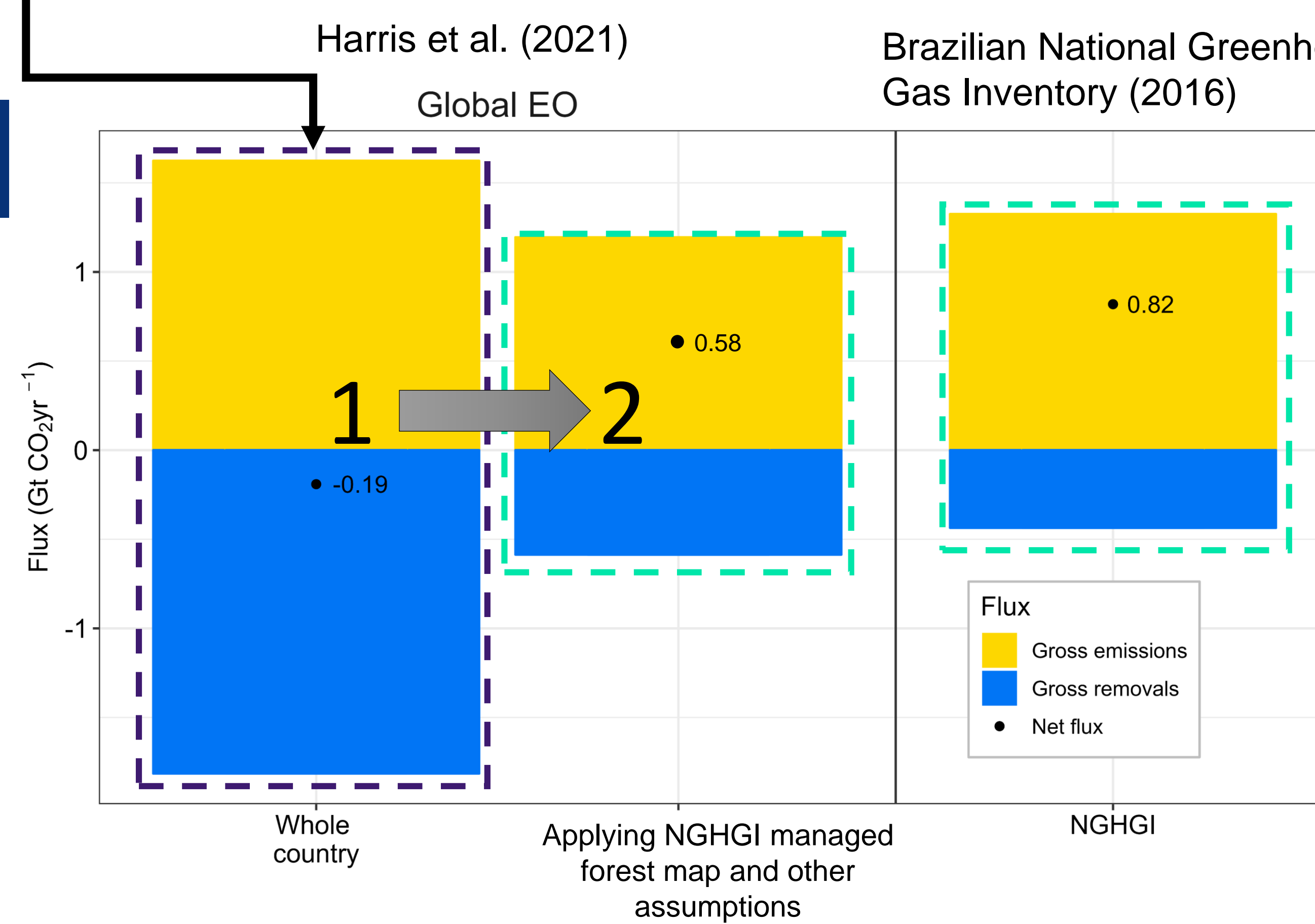
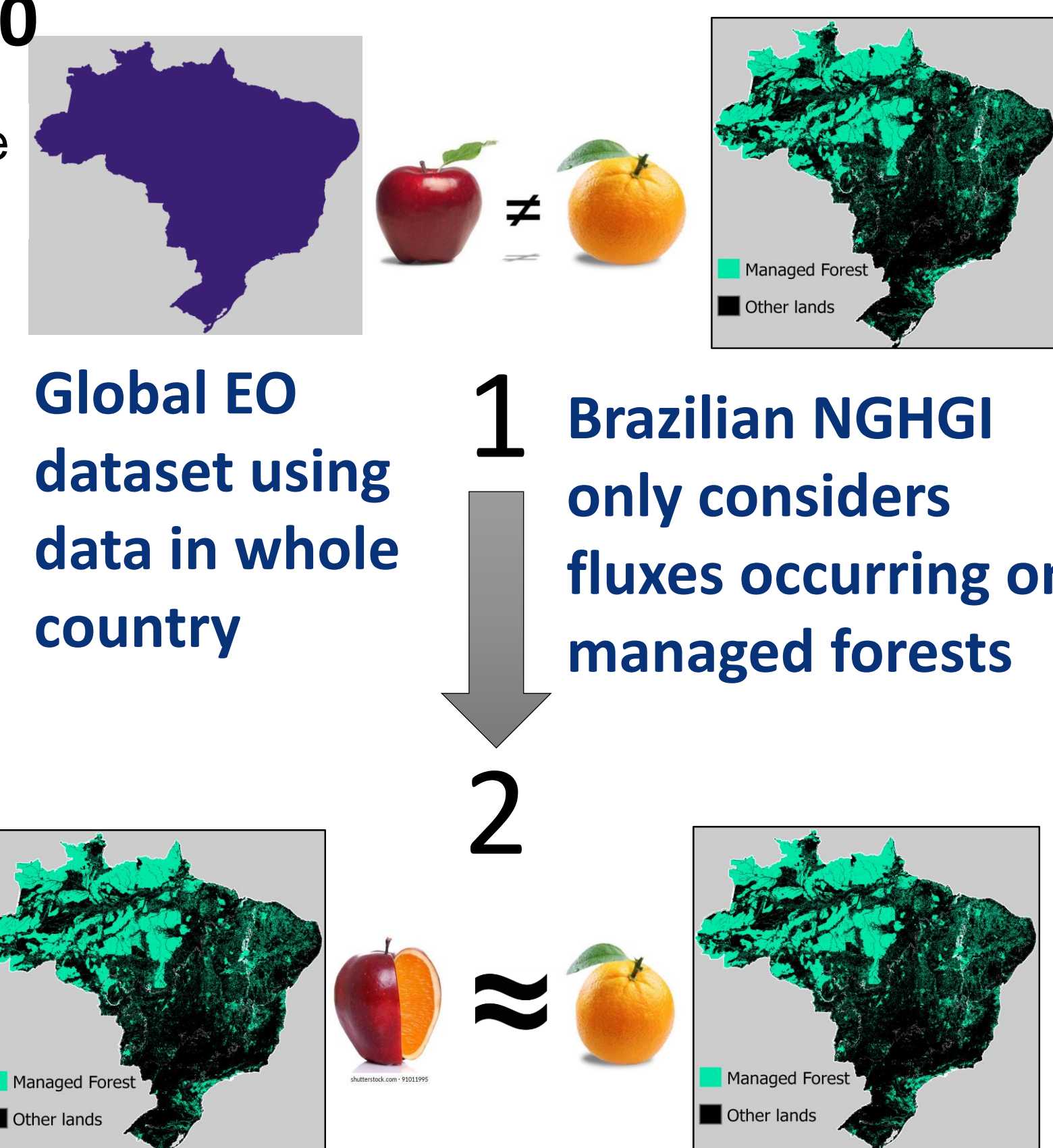


Figure adapted from Heinrich et al., 2023, Carbon Balance Manage.



Using spatially explicit, openly available managed forest map + other assumptions from Brazilian NGHGI

Recommendations for science and policy makers:

- Clarity from countries in their use of IPCC's Managed Land Proxy and forest categories used.
- Full transparency in the methodology used and open access to data by all approaches.
- For completeness, NGHGs could consider reporting GHG fluxes on unmanaged lands too.

