The scientific basis of forests as a key climate solution

Giacomo Grassi
European Commission, Joint Research Centre,
Directorate Sustainable Resources, Bioeconomy Unit

Forest Day, Bonn, COP23, 12th Nov 2017

Grateful to **Jo House** (University of Bristol) for comments

The Global Carbon Budget (2006-2015)

Anthropogenic sources:

34.1 $GtCO_2$/yr **91%**

+

3.5 $GtCO_2$/yr **9%**

Where the carbon goes:

16.4 $GtCO_2$/yr **44%**

11.6 $GtCO_2$/yr **31%**

26%

9.7 $GtCO_2$/yr

*Global Carbon Project (**Le Quéré et al.** 2016)*

Forests are part of the **problem** and part of the **solution**

Global forest CO_2 fluxes

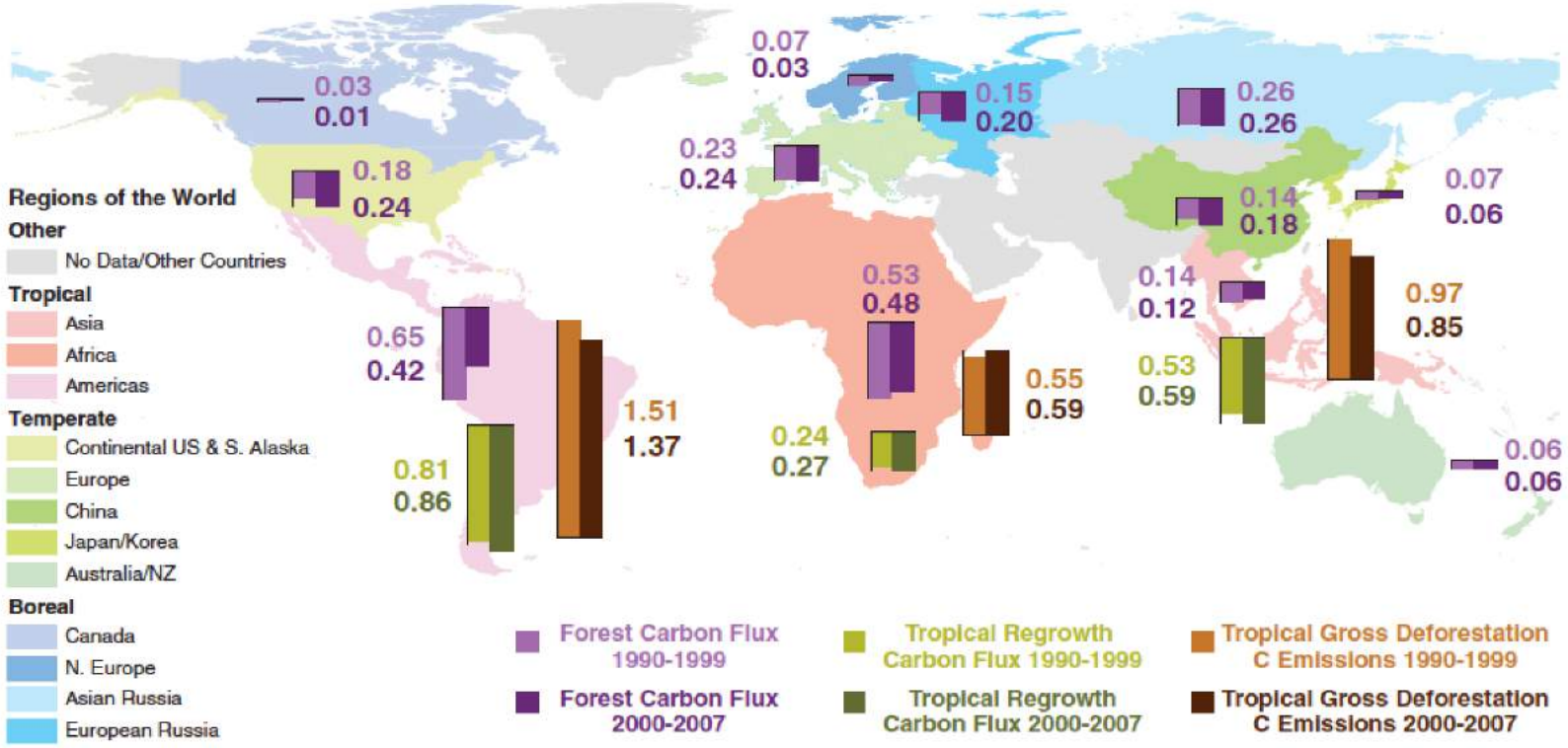


Fig. 1. Carbon sinks and sources (Pg C $year^{-1}$) in the world's forests. Colored bars in the down-facing direction represent C sinks, whereas bars in the upward-facing direction represent C sources. Light and dark purple, global established forests (boreal, temperate, and intact tropical forests); light and dark green, tropical regrowth forests after anthropogenic disturbances; and light and dark brown, tropical gross deforestation emissions.

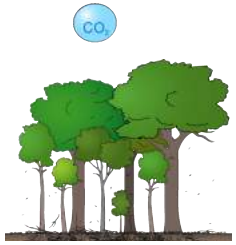
*(**Pan et al**. A Large and Persistent Carbon Sink in the World's Forests, Science, 2011)*

The largest uncertainties are in the tropics (from deforestation and forest regrowth)

Forest mitigation options

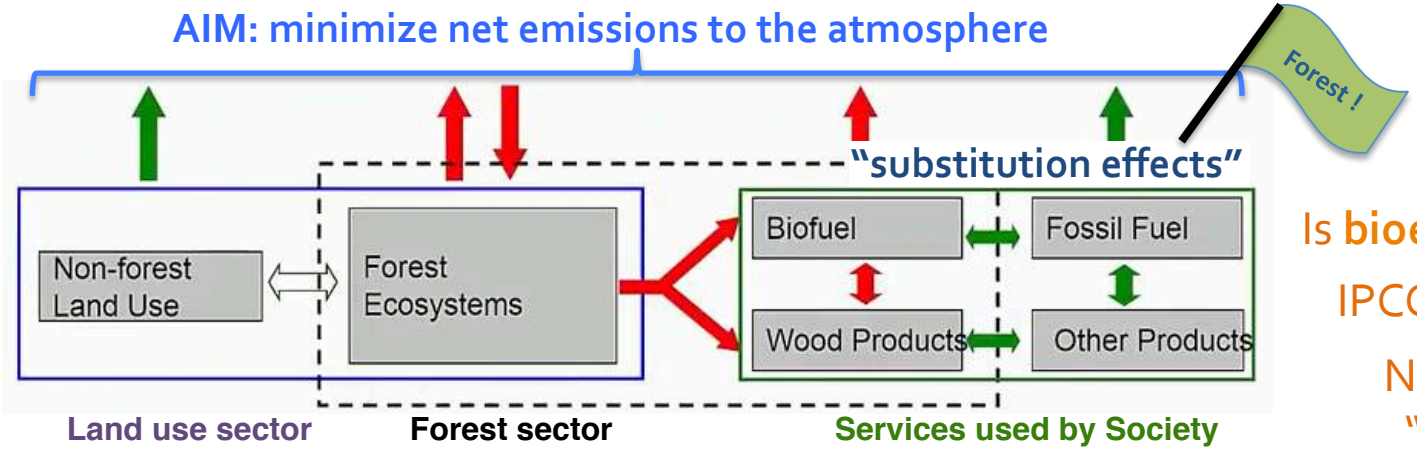
- Reducing emissions from Deforestation and forest Degradation

- Conserve and enhance C stock and sink: (Forest Management, Afforestation, Restoration)



including in wood products

IPCC AR4: need of a system perspective on forest-sector mitigation strategies



Is **bioenergy C-neutral**?

IPCC never said that!

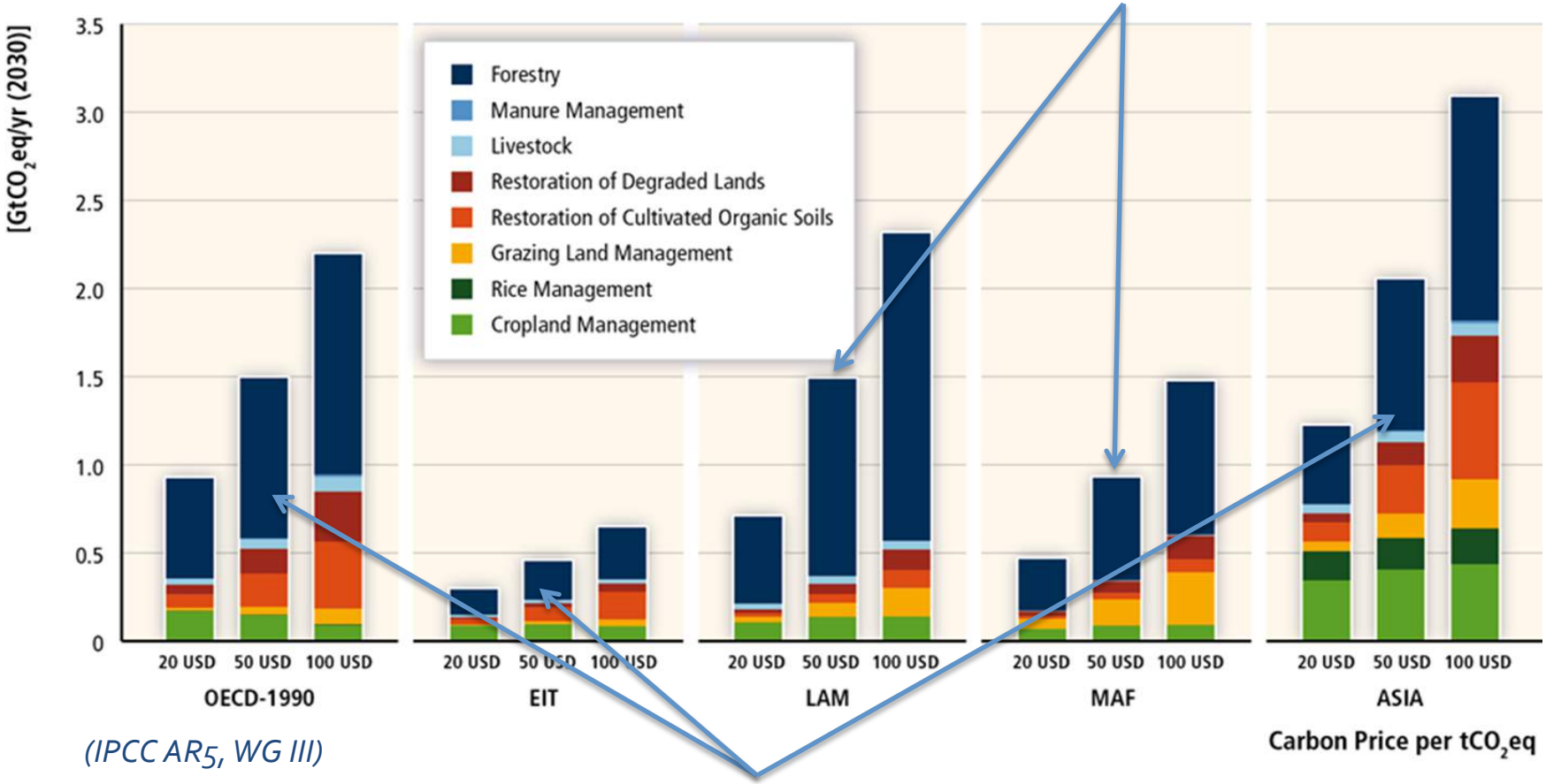
Need of correct **"accounting"**

*(**W. Kurz**, The contribution of forest sector to climate change mitigation https://www.youtube.com/watch?v=DzuogSy1Oy8, based on IPCC AR4, WGIII)*

IPCC AR5: forestry dominates the land sector mitigation potential in most regions

(up to 13.8 $GtCO_2$/yr globally)

Reduced deforestation dominates in LAM and MAF

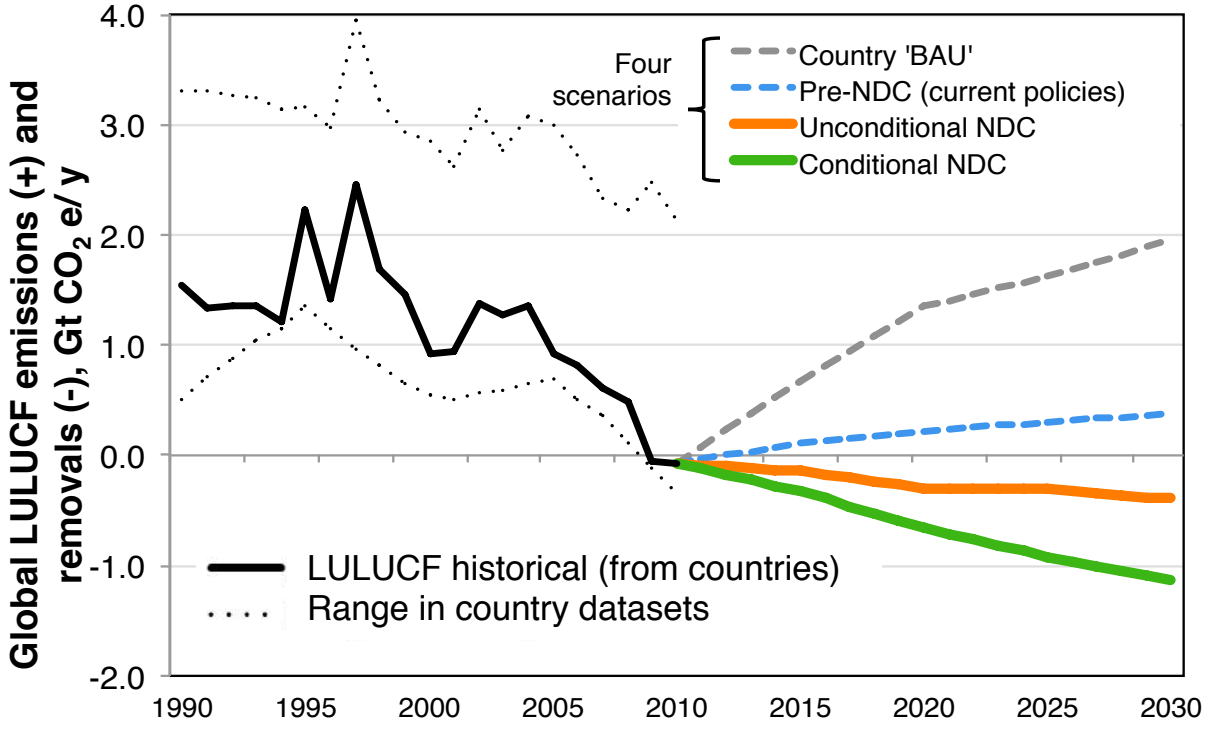


(IPCC AR5, WG III)

Forest management and **afforestation** dominate in OECD, EIT and ASIA

Despite this mitigation potential, till recently forests have been often seen as a secondary mitigation option by climate policy

like Cinderella excluded from the ball…



*(**Grassi et al**. The role of Forest in the Paris Agreement, NatureCC, 2017)*

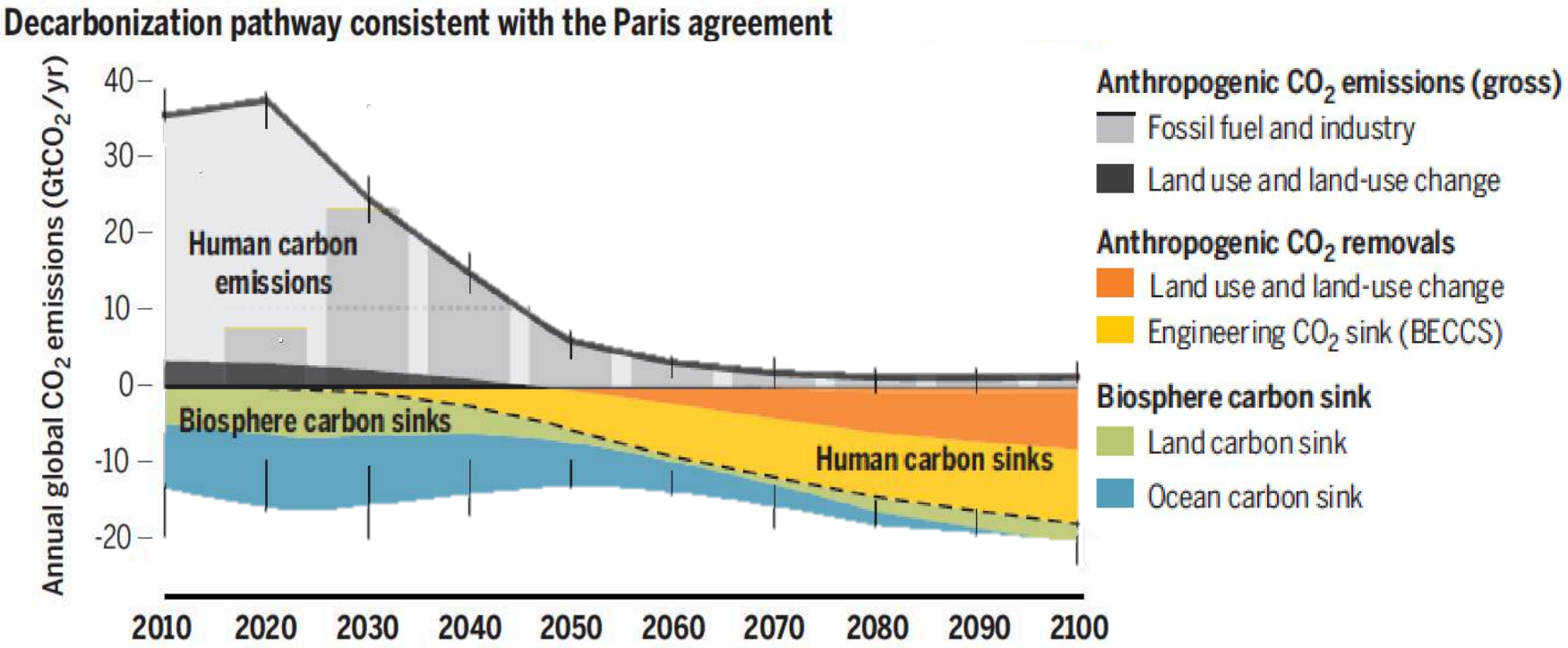
According to countries' NDCs, **forests expected to provide 25% of *planned* global emission reductions by 2030**

≈ 0.8 $GtCO_2e/yr$

≈ 0.7 $GtCO_2e/yr$

→ apparently Cinderella shined at the Paris ball…

After Paris, **science became even more clear** on the role of forests in reaching the 2°C target and the "*balance of emissions and removals in 2nd half of the century*"



(***Rockström et al**. A roadmap for rapid decarbonization. Science, 2017)*

New evidence is mounting on a larger magnitude of forest mitigation potential
(e.g. Houghton et al. 2016, Smith et al. 2016, Griscom et al. 2017, Roe et al. 2017)

[but don't let this "mitigation promise" become an excuse not to drastically reduce fossil fuels!]

Concluding remarks

Turning this mitigation potential into reality requires further steps:

- Identifying the most cost-effective mitigation options, and synergies & tradeoffs with adaptation and other ecosystem services: **IPCC Special Reports** on **1.5°C** (2018) and **Climate Change and Land** (2019), and the **6th Assessment Report** (2022)
- Increasing confidence in emission estimates: countries should invest more on monitoring, supported by the **2019 Revised IPCC Methodological Guidelines**

Science leaves no doubts: **we can't achieve the Paris goals without a significant contribution from forests**.

Forests have the opportunity and responsibility to deliver:
the mitigation potential is there.

Now, it's time for action