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Economics of Afforestation: A Global Leadership Opportunity for EfD

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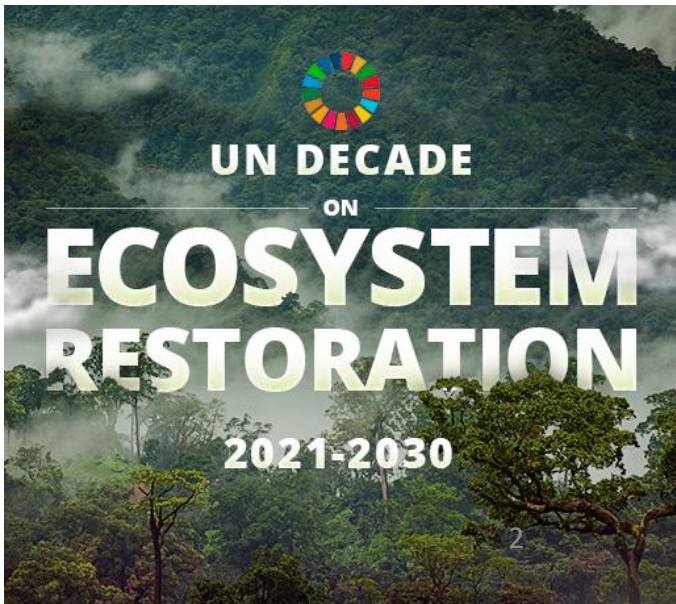
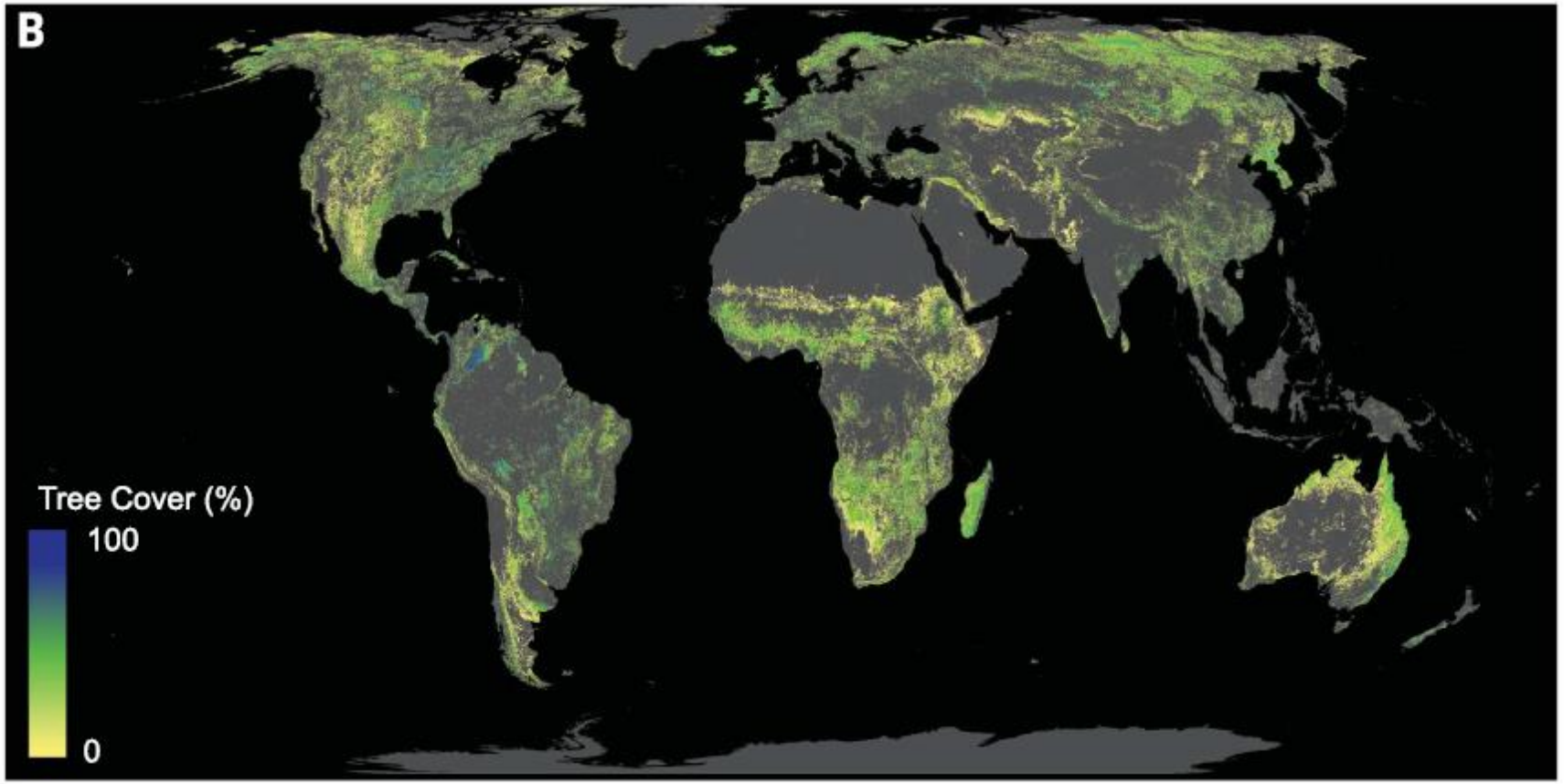
Bogota, Nov. 23, 2019

BONN CHALLENGE

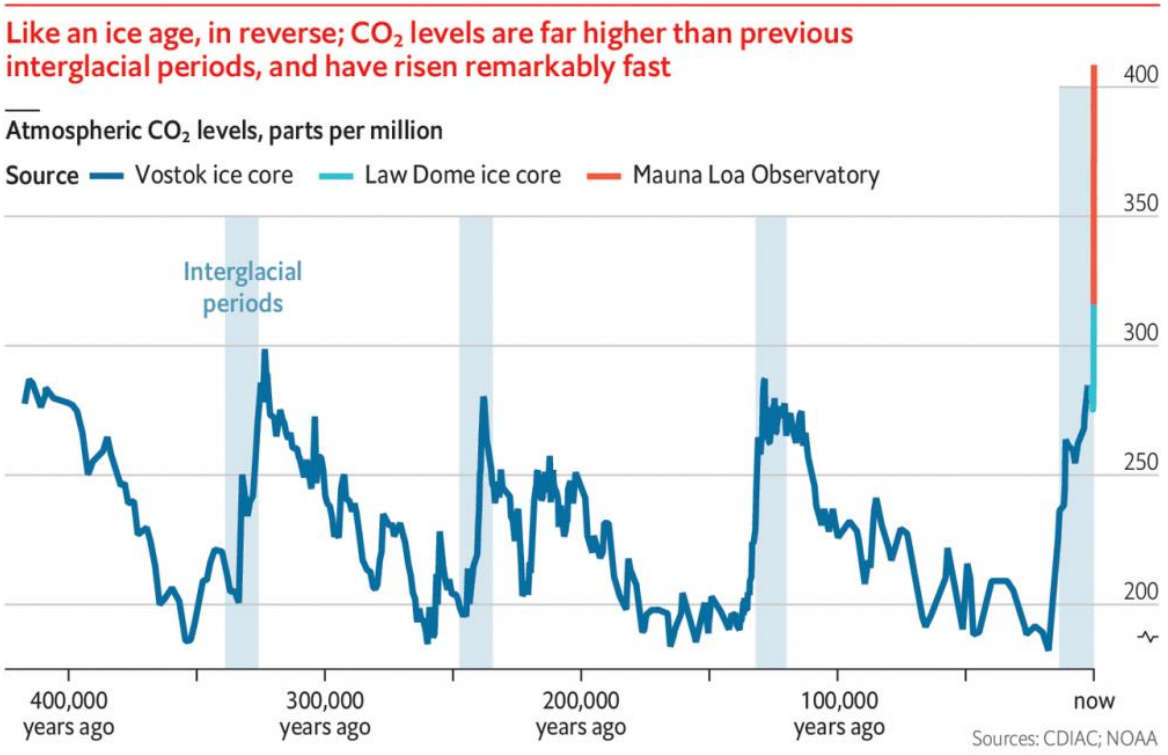
New York Declaration on Forests

GLOBAL PLATFORM





Source: Bastin et al. (*Science*, 2019)



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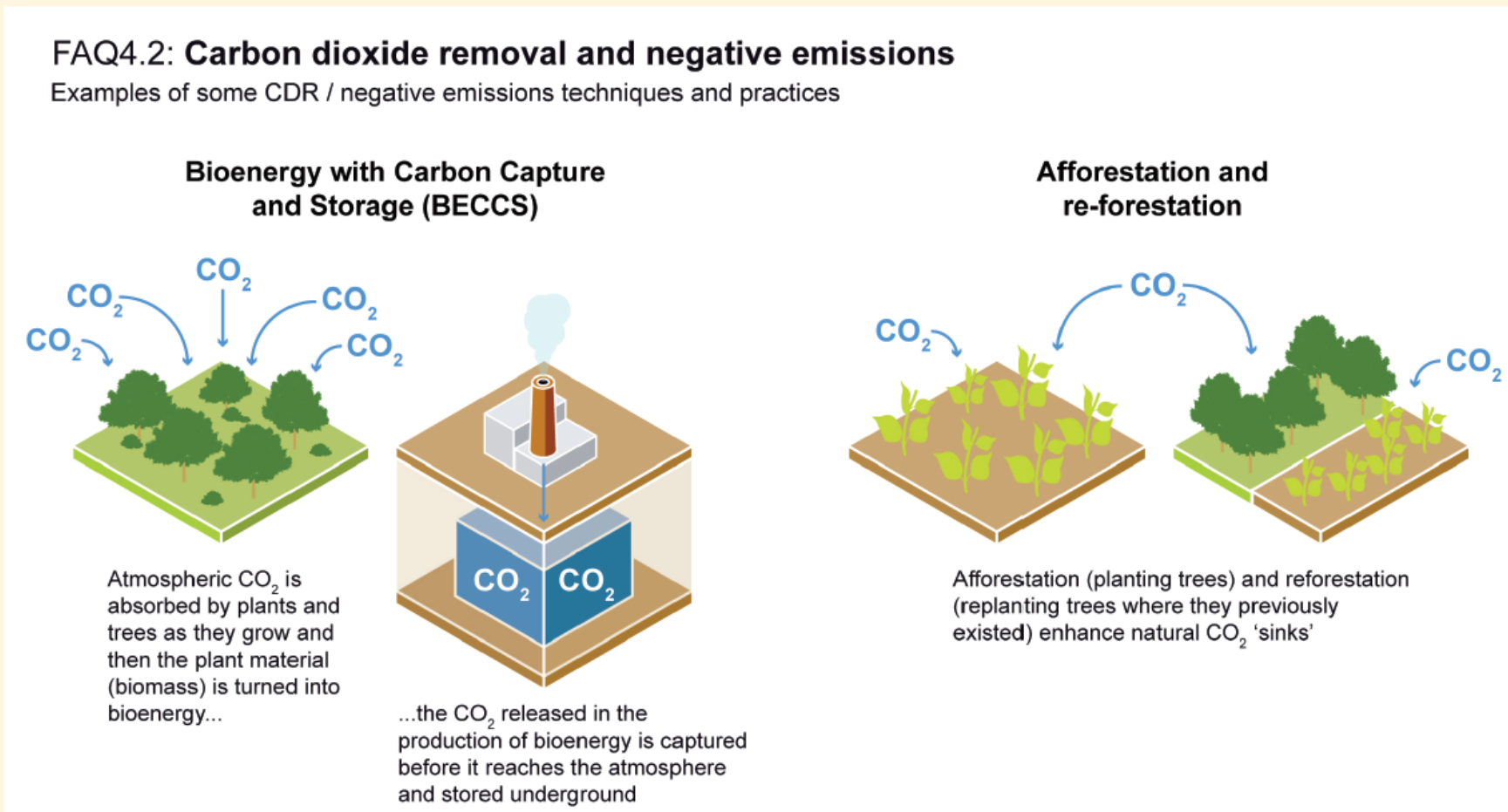
Source: *The Economist* (Sept. 19, 2019)



FAQ 4.2, Figure 1 | Carbon dioxide removal (CDR) refers to the process of removing CO_2 from the atmosphere. There are a number of CDR techniques, each with different potential for achieving 'negative emissions', as well as different associated costs and side effects.

Source: IPCC, *Global Warming of 1.5°C* (2018), Ch. 4

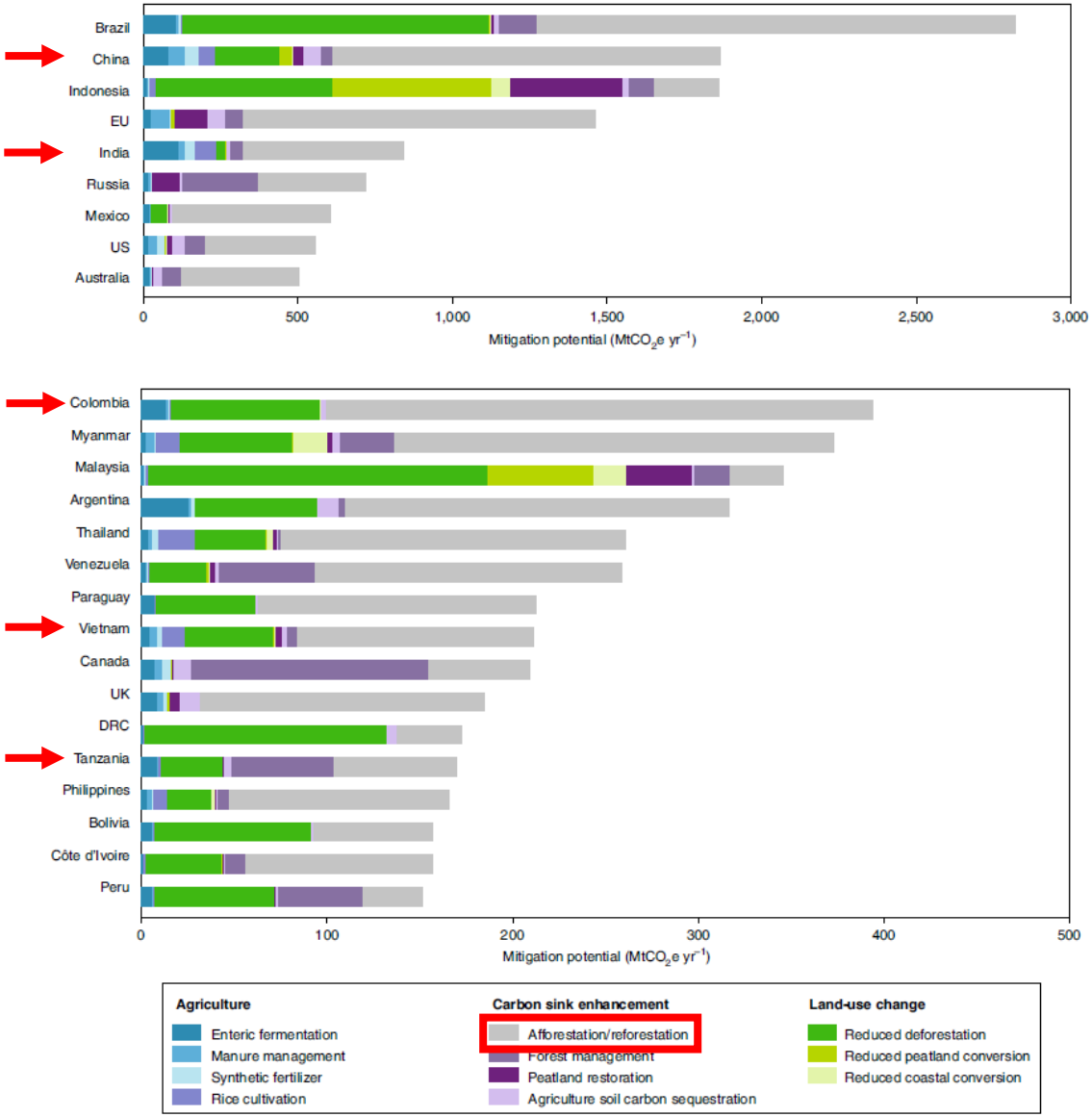
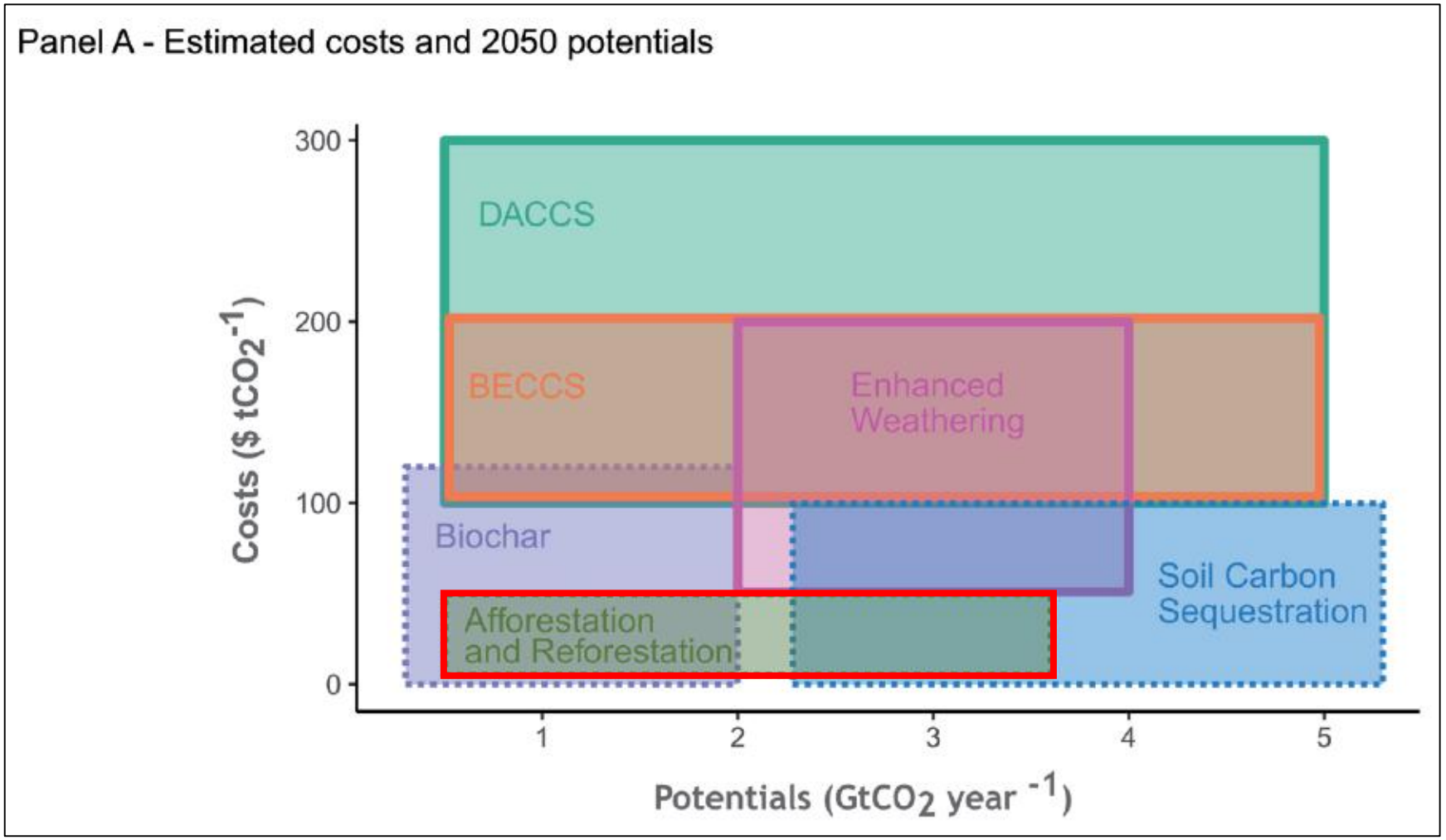


Fig. 5 | Land-based mitigation potential in 2020–2050 by region. The top 25 countries or regions with the highest mitigation potential are presented, nine with over 500 $MtCO_2e\ yr^{-1}$ (top panel) and 16 with 100–400 $MtCO_2e\ yr^{-1}$ (bottom panel). Numbers are compiled from country mitigation potentials in ref. [18] (Rice cultivation, Forest management, Peatland restoration, A/R, Reduced deforestation, Reduced peatland conversion and Reduced coastal conversion), as well as percentages of FAOSTAT emissions data calculated for this study (Enteric fermentation, Manure management, Synthetic fertilizer and Agriculture soil carbon enhancement). Additional detail and data available in Supplementary Information section 1.3 and Supplementary Table 4.

Source: Roe et al. (*Nature Climate Change*, 2019)



Source: IPCC, *Global Warming of 1.5°C* (2018), Ch. 4

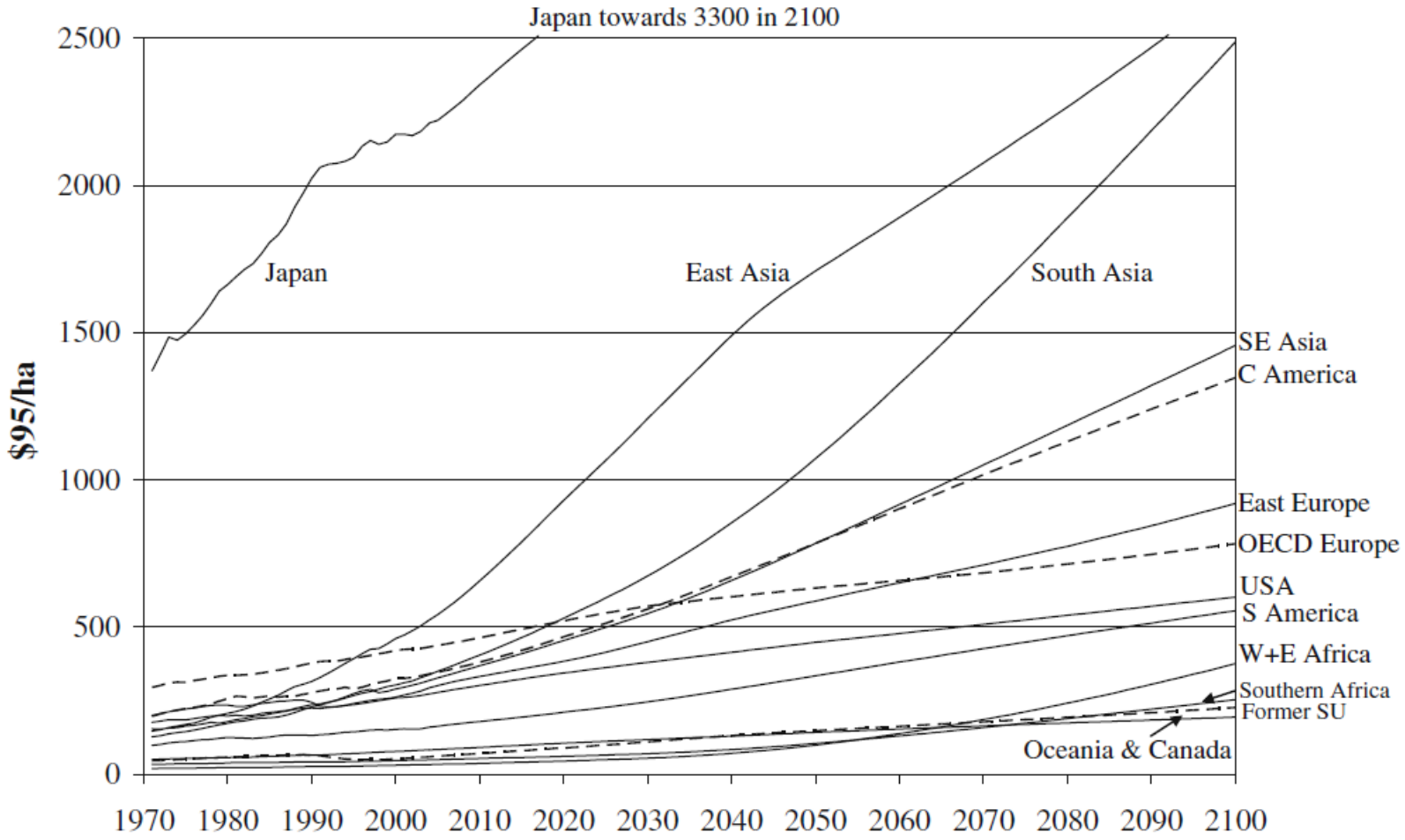


Fig. 7 Land costs of some major regions in the B2 baseline-scenario

Source: Strengers et al. (*Climatic Change*, 2008)

Economists: MIA in forest restoration research

- DEFORESTATION
  - (*Psst … a third of LMICs had increasing forest area during 2010-2015*)
- Impacts of *decades* of afforestation/reforestation programs/policies have gone unevaluated
  - Environmental: tree cover, carbon storage, biodiversity, natural forest pressure, …
  - Economic: income, employment, poverty, migration, … (inc. intra-household differences)

Afforestation: lower cost, lower risk?

- Definitions
  - ***Reforestation***: reestablishing forests on forestland
  - ***Afforestation***: establishing forests on non-forestland
- Afforestation of *marginal/abandoned agricultural land*:
  - Opportunity cost: low
  - Tenure: typically clearer and more secure than on public and community forestlands
  - Access: typically better too (planting, harvesting)

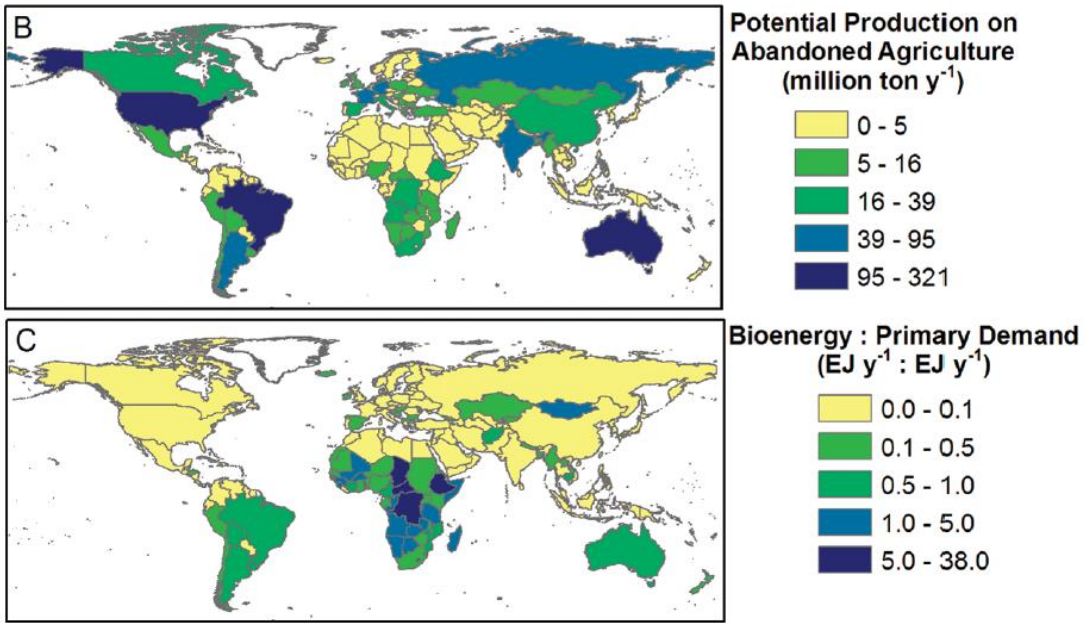


FIGURE 2. Biomass production potential on abandoned agriculture lands. (A) Natural above-ground production of biomass on all lands determined from the CASA model, assuming 50% of the biomass is above-ground and the ratio (by mass) of biomass to carbon is 2.2. (B) Potential above-ground production of biomass on abandoned agriculture lands at the country level. (C) Ratio of the energy content of the biomass on abandoned agriculture lands relative to the current primary energy demand at the country level. The energy content of biomass is assumed to be 20 kJ g^{-1}.

Source: Campbell et al. (*Environ. Sci. Technol.*, 2008)

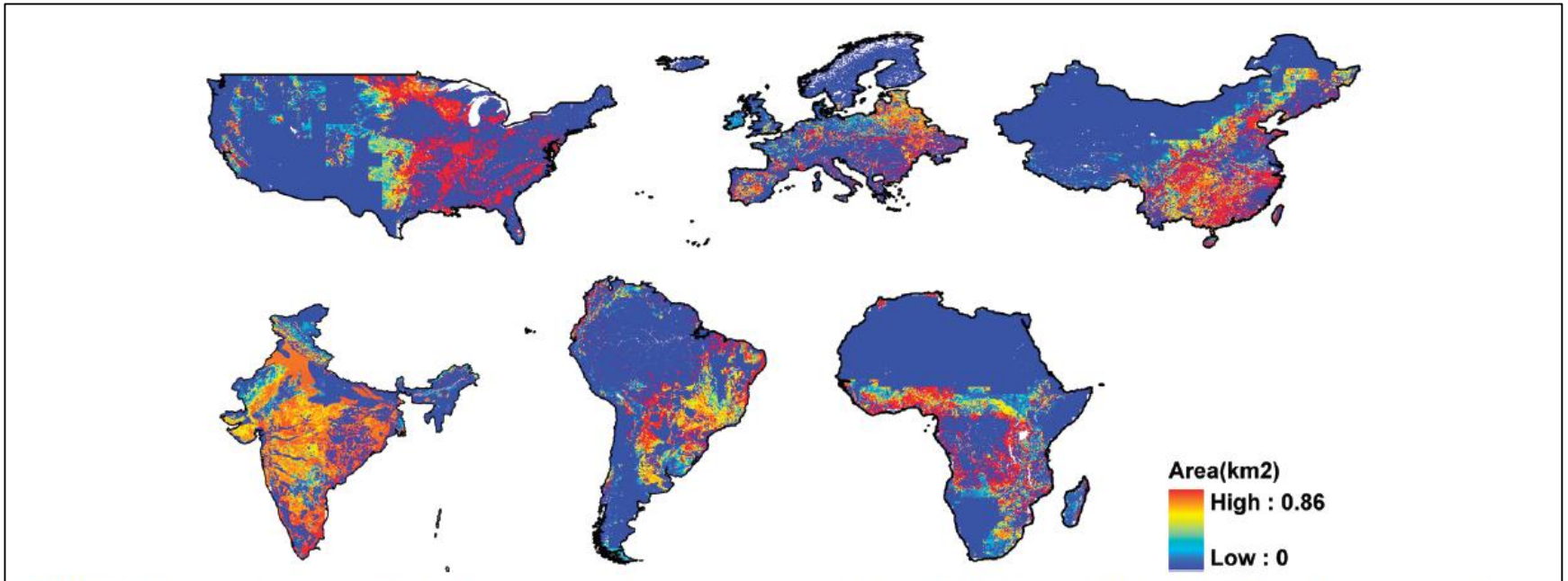


FIGURE 2. Maps of land available for bioenergy production under scenario 4 in U.S., Europe, China, India, South America, and Africa.

Source: Cai et al. (*Environ. Sci. Technol.*, 2011)

Table 1. Percentages of LMICs that had decreasing agricultural land area or increasing forestland area during 2010–2015, by 2015 rural population growth rate groups (negative or positive)

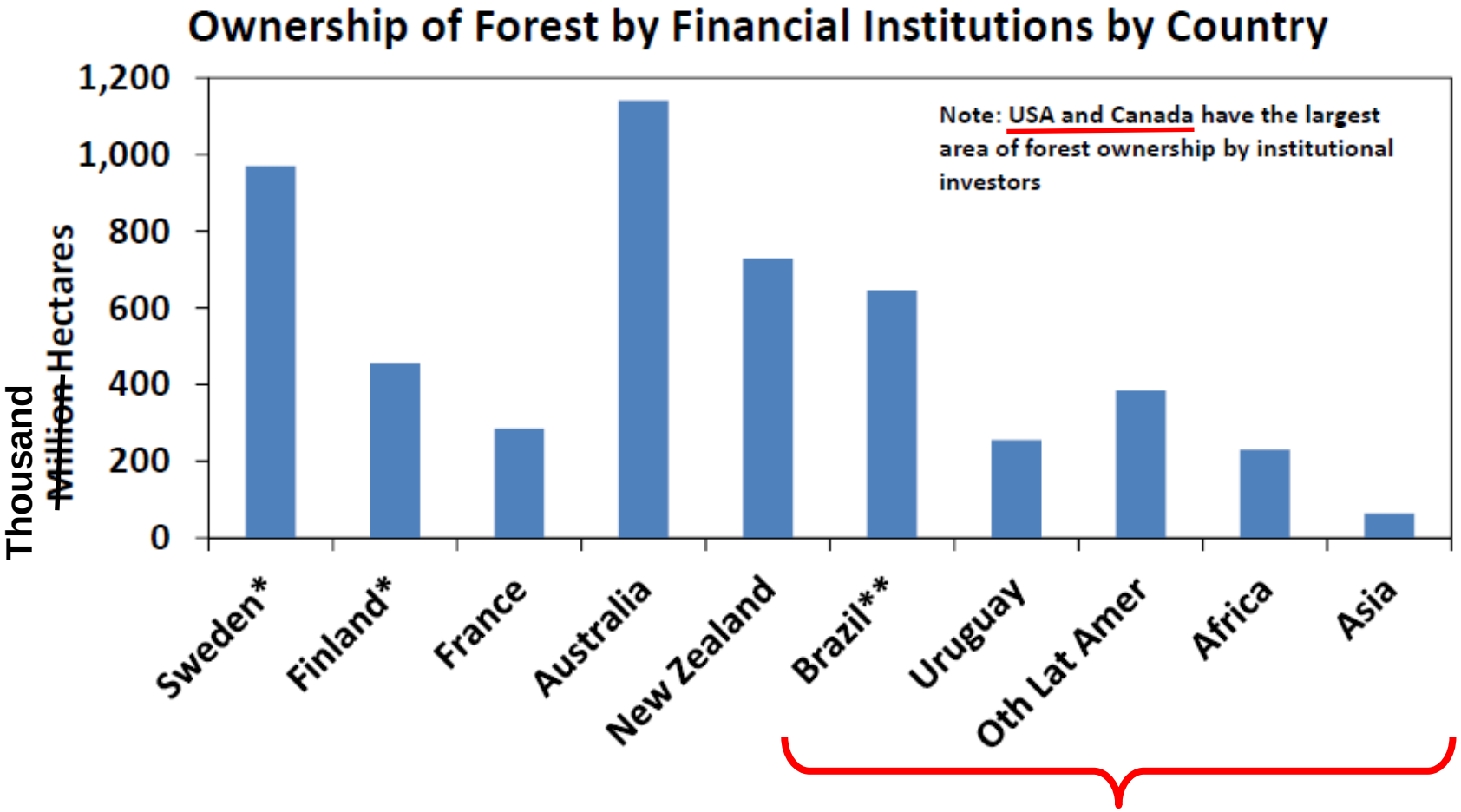
Sources: FAOSTAT for land use,[11] WDI for rural population growth rates[12]

Land use	*Countries with negative rural population growth in 2015 (33% of sample)*	*Countries with nonnegative rural population growth in 2015 (67% of sample)*
Decreasing agricultural land	47%	30%
• Arable land[a]	44%	31%
• Permanent crops	36%	21%
• Permanent meadows and pastures	47%	14%
Increasing forestland	51%	27%

[a] Includes temporary crops, temporary meadows and pastures, and land with temporary fallow.

Economic research needs

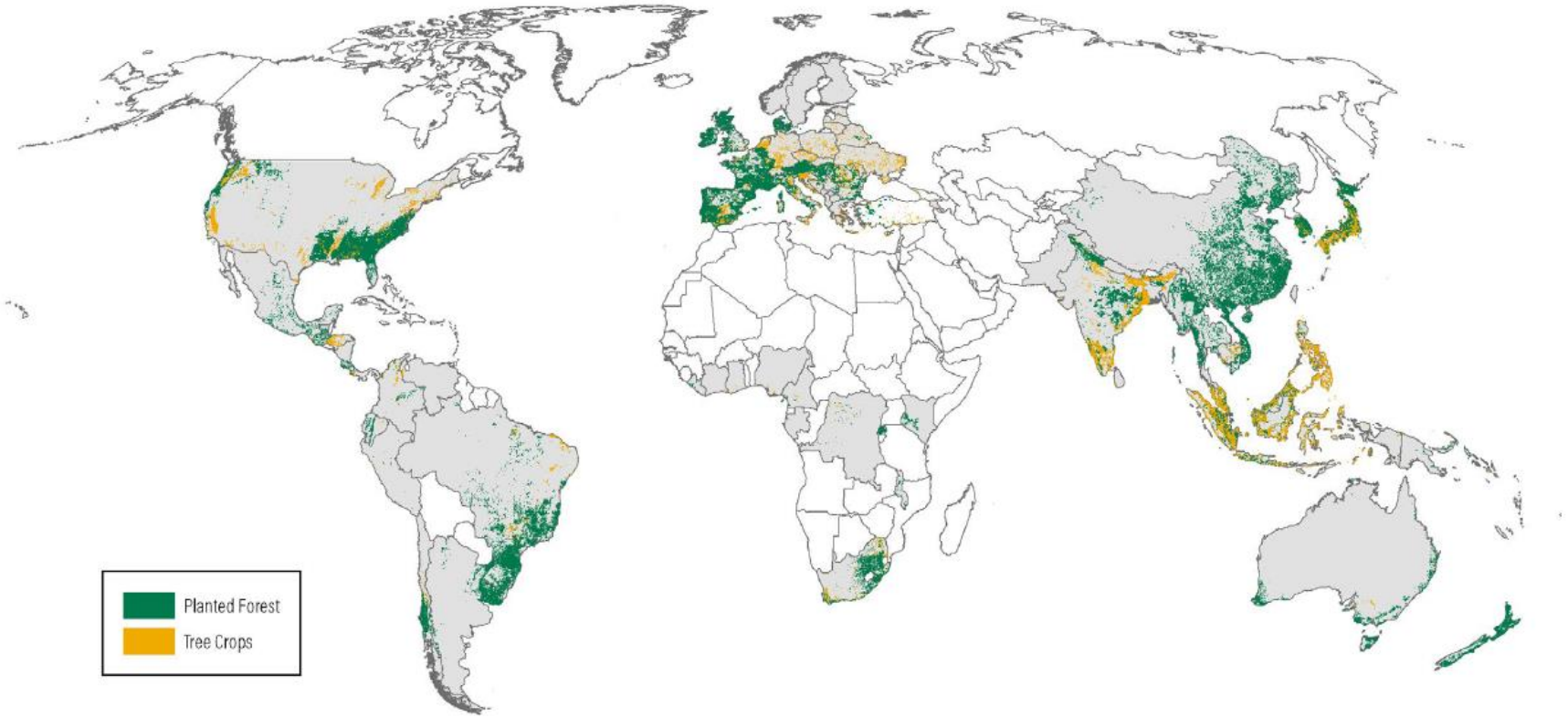
1. Compile georeferenced forestry and economic data from documents on current or past afforestation programs
2. Retrospective analysis: evaluate impacts of current or past afforestation projects/programs/policies
3. Prospective analysis: choice experiments, field experiments, RCTs to test design features of prospective afforestation projects/programs
4. Targeted analysis of impediments to institutional investment in afforestation and policy options for overcoming them



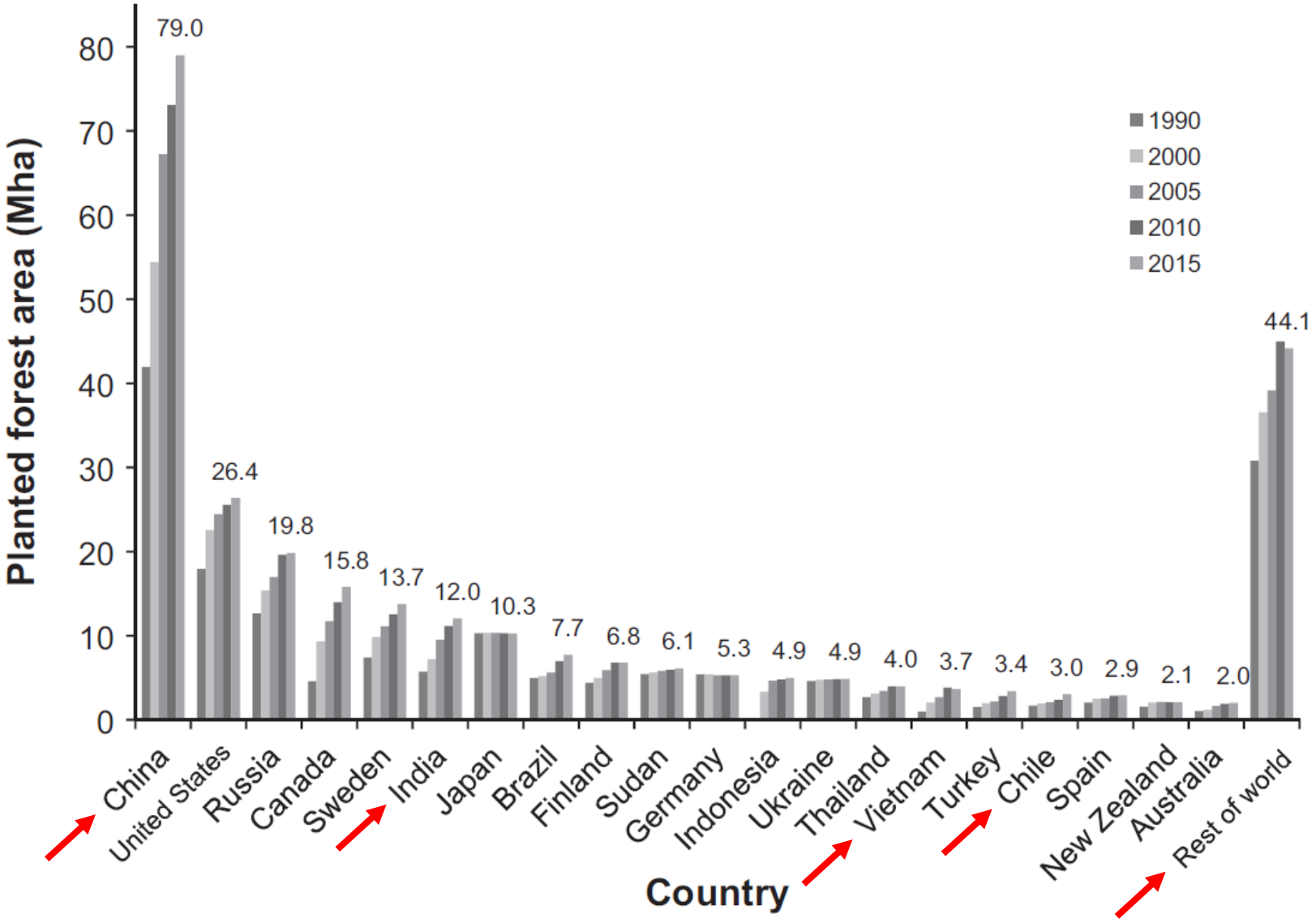
Source: Flynn (RISI, 2016)


THE NEW YORKER
NOV 11 2019
Impeachment goes public
by Steve Coll
The Amazon Is Burning
Under Brazil's right-wing President, Jair Bolsonaro, the country's rain forest is being destroyed at a dramatically increasing rate. As the loggers and miners move in, Jon Lee Anderson visits an indigenous tribe to survey the devastation
When America Tried to Deport Its Radicals
Adam Hochschild on the wily official who saved them
How Many Fingers Am I Holding Up?
Nick Paumgarten on hockey and his multiple concussions
Subverting the Hollywood Playbook
John Lahr on the director Todd Haynes's film experiments
Winter Culture Preview
TOP TIRE PICKS • GREAT GIFTS UNDER $50

Figure 1 | **Global Map of Planted Forests and Tree Crops**

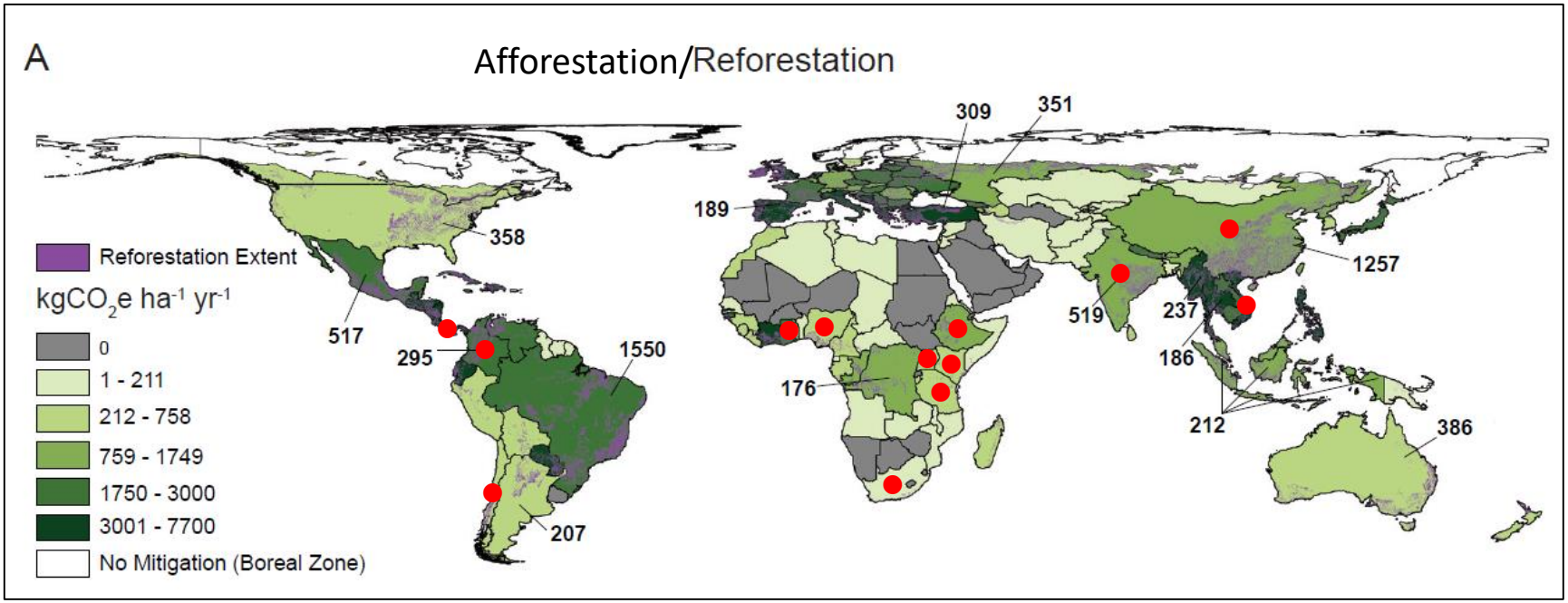


Source: Harris et al. (WRI, 2019)



Source: Payn et al. (*Forest Ecology and Management*, 2015)

EfD: ideal platform for the needed research



Source: Griscom et al. (*PNAS*, 2017)

Let's talk – Jeff.Vincent@duke.edu

(including about reforestation)