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# Climate and Debt

## Ugo Panizza

Debt and innovative finance in developing countries

UNU Wider-BOFIT

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Patrick Bolton, Lee Buchheit, Mitu Gulati,  
Ugo Panizza, Beatrice Weder di Mauro  
and Jeromin Zettelmeyer

## CLIMATE AND DEBT

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**A perfect storm ?**



**300**

**40**

**60%**

**6**

# Outline

1. Climate perspectives
2. Debt and fiscal space
3. Financing
  1. Debt for climate: Green bonds
  2. Credit for climate: Carbon credit market
  3. Debt relief for climate
4. Policies

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# I. Climate

## 1. Planetary view

- **Net zero – where the emissions are - mitigation**

## 2. Local perspective

- **Vulnerability and adaptation**

## 3. Conservation

- **Remaining carbon sinks**
- **Hotspots and biodiversity**

## 4. Distributional perspective

- **Climate equity**

# The planetary view: A global common:

300

Approximate global warming relative to 1850–1900 until temperature limit (°C)*(1)	Additional global warming relative to 2010–2019 until temperature limit (°C)	Estimated remaining carbon budgets from the beginning of 2020 (GtCO <sub>2</sub> )				
		<i>Likelihood of limiting global warming to temperature limit*(2)</i>				
		17%	33%	50%	67%	83%
1.5	0.43	900	650	500	400	300
1.7	0.63	1450	1050	850	700	550
2.0	0.93	2300	1700	1350	1150	900

40

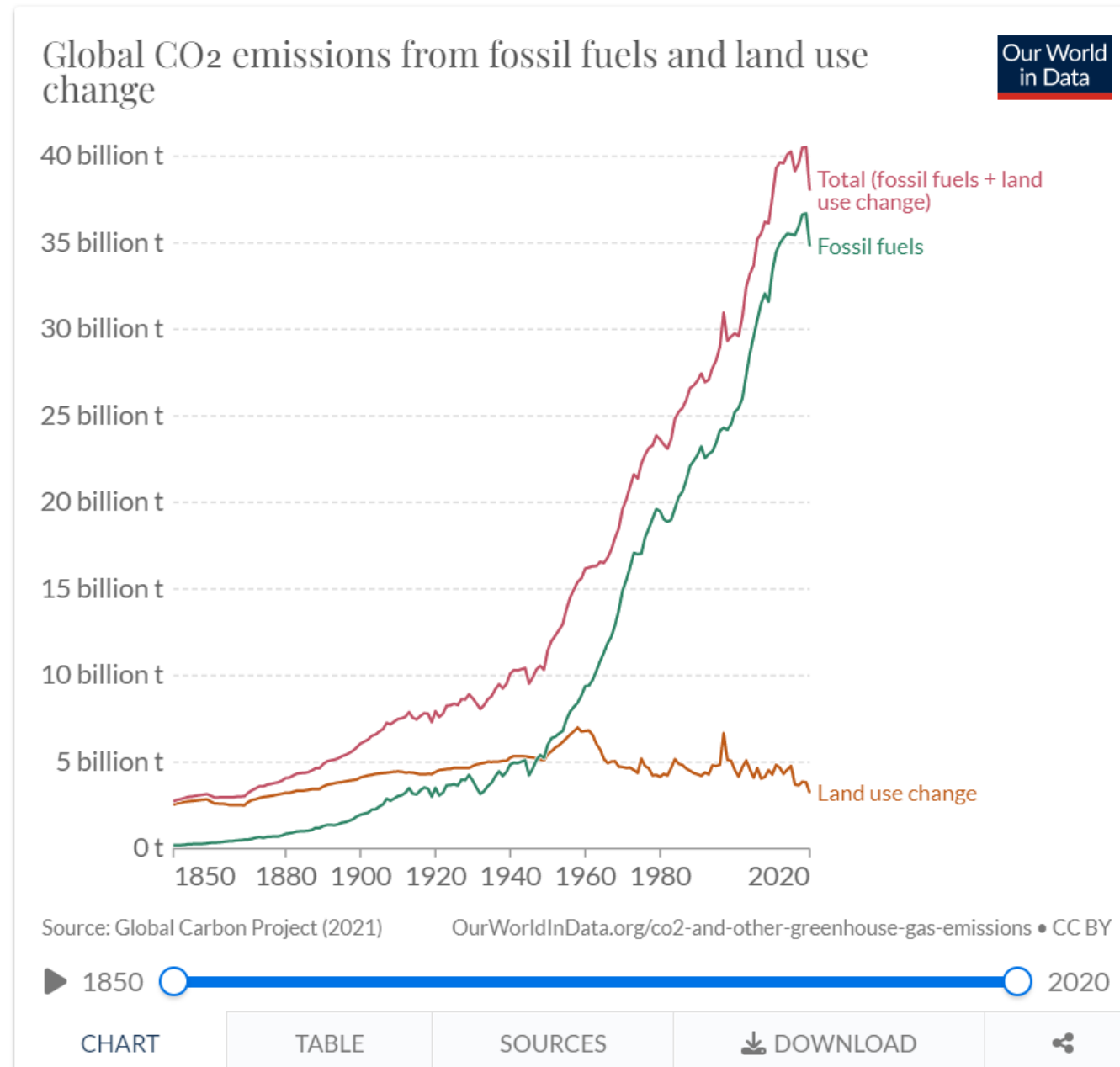
60%

6

IPPC 2021, Tabelle SPM.2

# The planetary view: A global common:

*How much is  
300/40?*



300

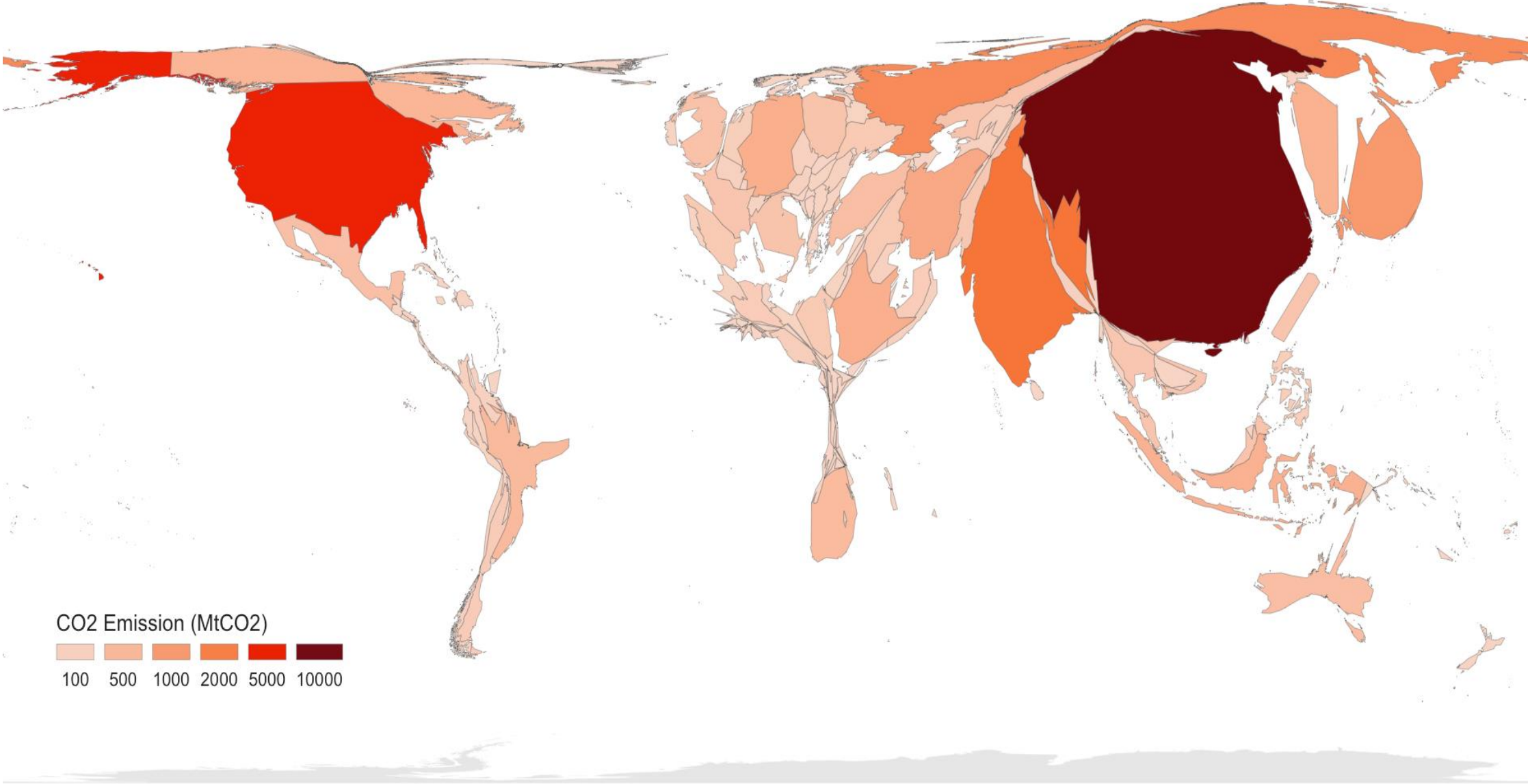
40

60%

6

# The planetary view:

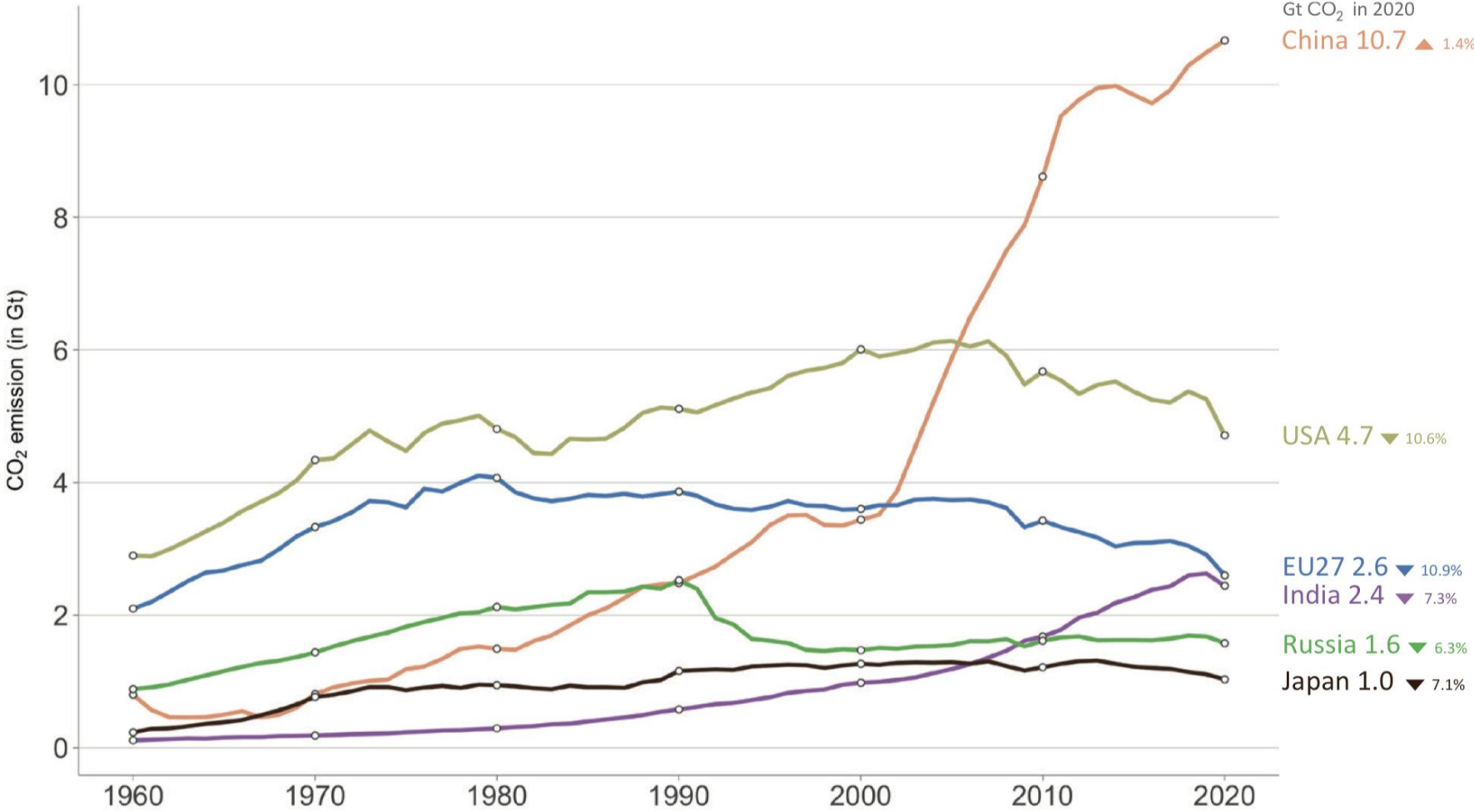
The planet does not care who is emitting





# The planetary view: Growing like China is not an option

FIGURE 2.5 TOP GLOBAL EMITTERS, 1960-2020



Source: Global Carbon Project

# I. Climate

## 1. Planetary view

- Net zero – where the emissions are - mitigation

## 2. Local perspective

- **Vulnerability and adaptation**

## 3. Conservation

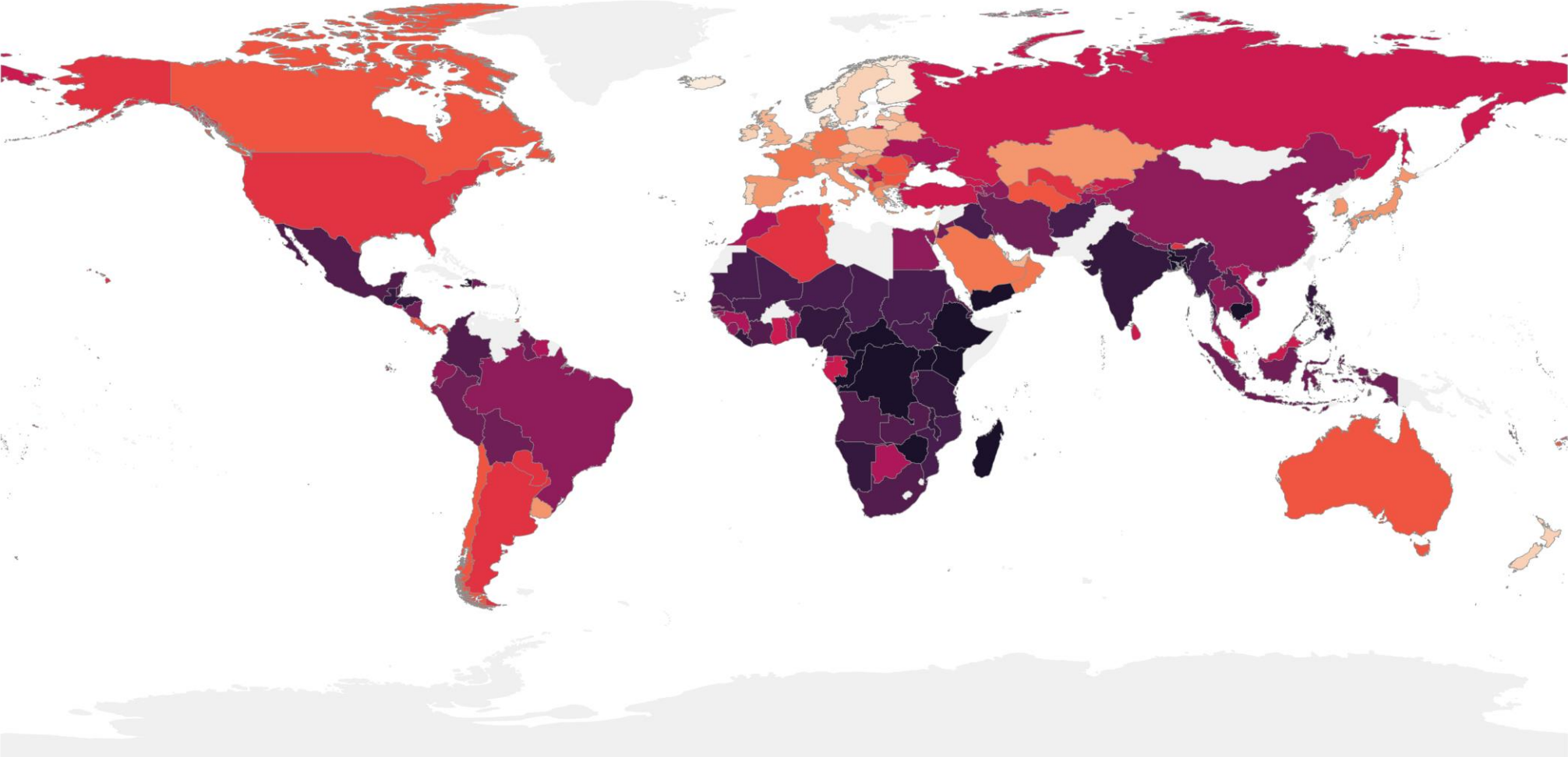
- Remaining carbon sinks
- Hotspots and biodiversity

## 4. Distributional perspective

- Climate equity

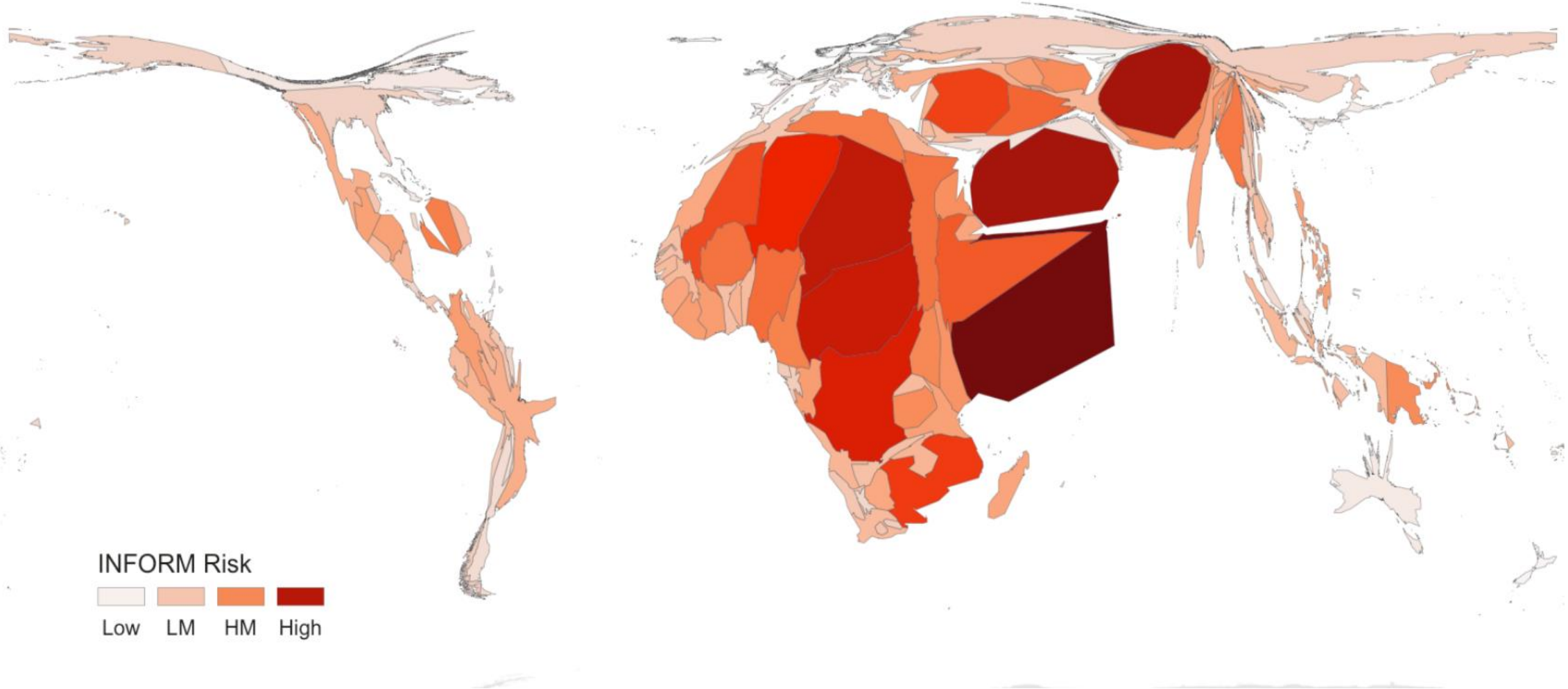
# The local view:

Who is vulnerable to climate change?  
INFORM risk index



# The local view:

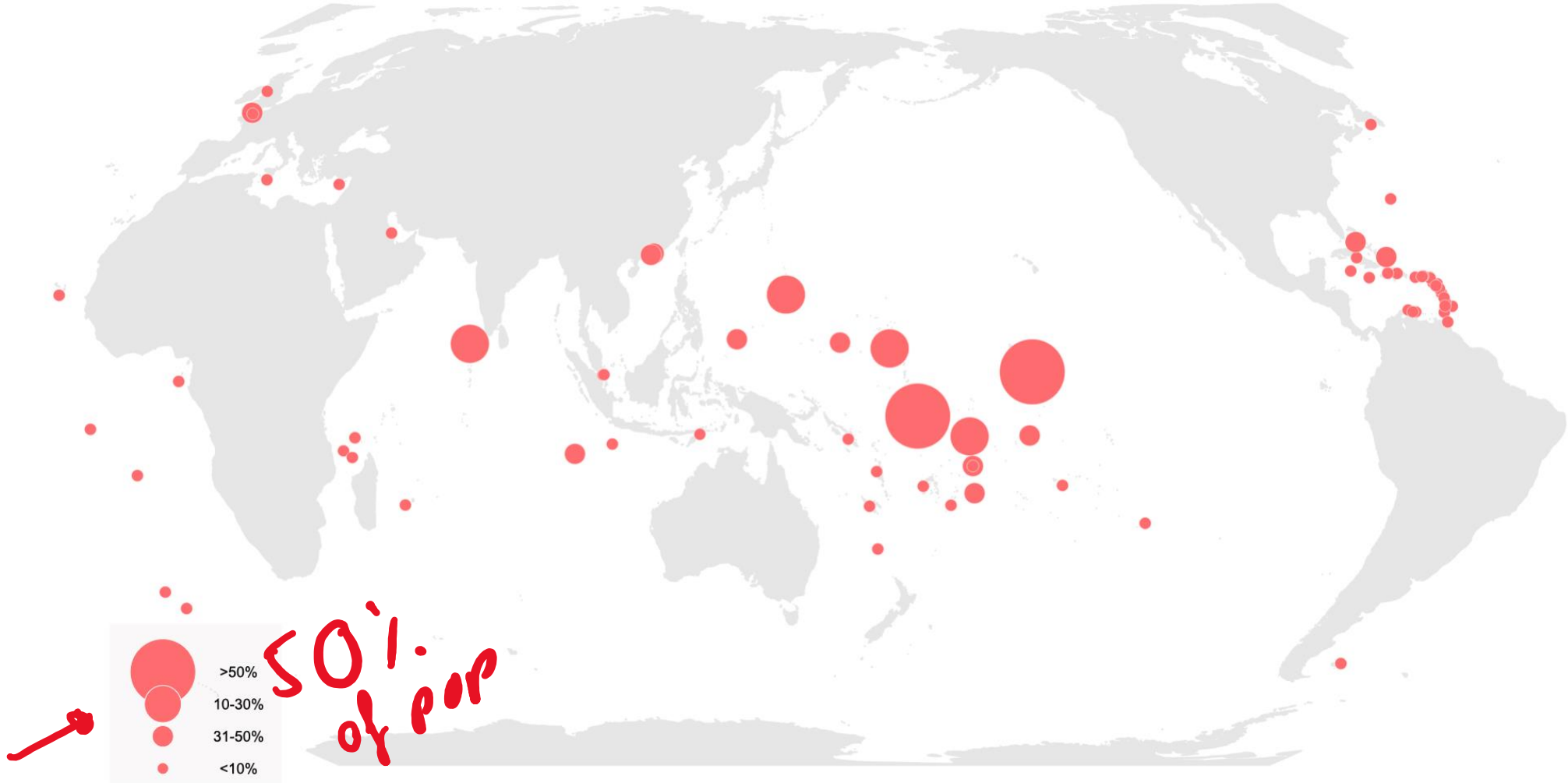
Who is vulnerable to climate change?  
INFORM risk index



# The local view:

# Who is vulnerable to climate change?

Percentage of population exposed to rising sea levels



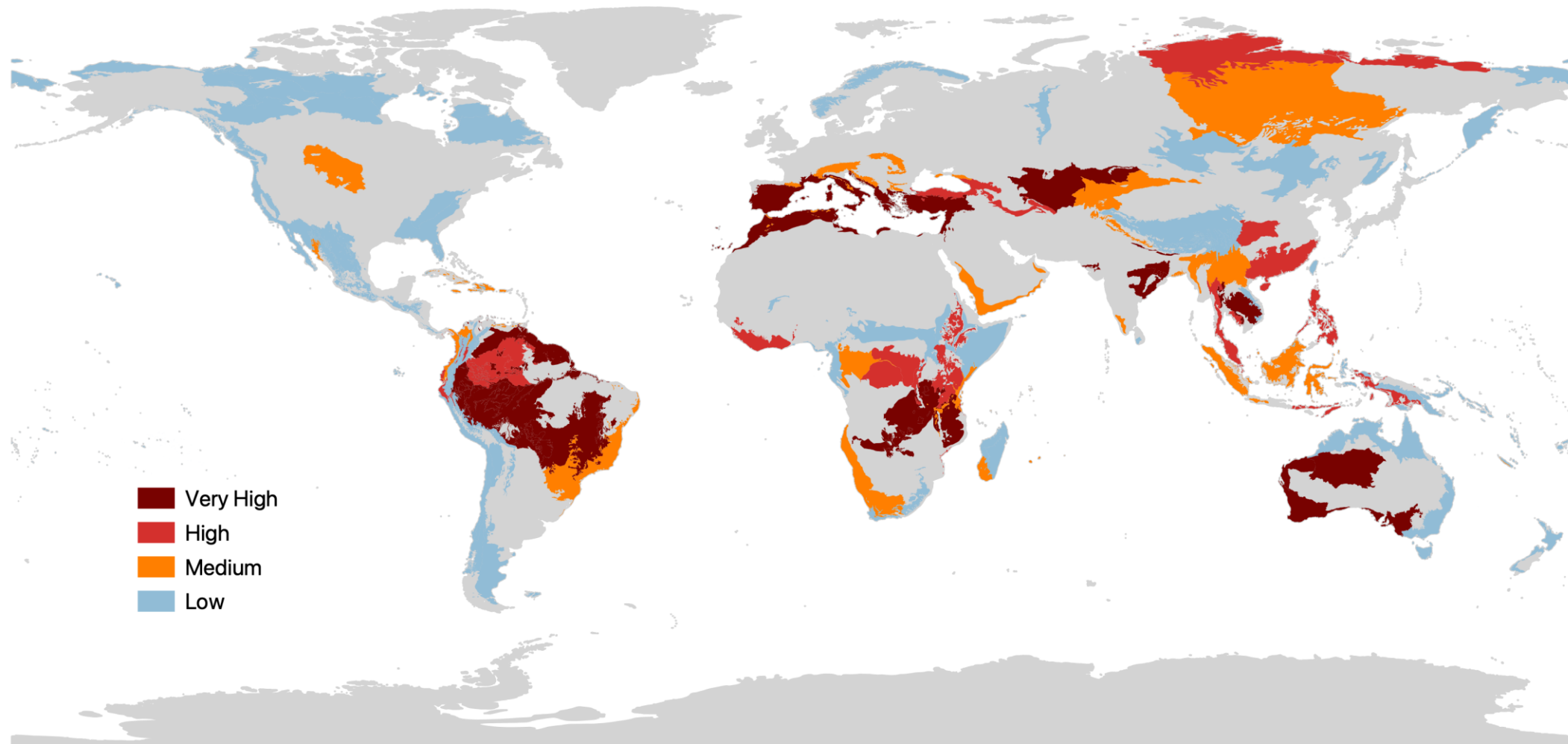
Source : own compilation-based on IPCC WGII 2022, Figure 15.3 ,

# I. Climate

## 1. Local perspective

- Even at 1.5 degrees the frequency and severity of natural disasters will increase
- The most exposed regions tend to be LICs, and islands
- They need adaption investment
  - Financing?

### 3. Conservation: Biodiversity as global common At risk from warming



# I. Climate

## 1. Conservation perspective

- **There are unexploited carbon sinks**
  - **In low emitting parts of the world**
  - **How to conserve them?**
    - **Strand the assets**
    - **Compensate**

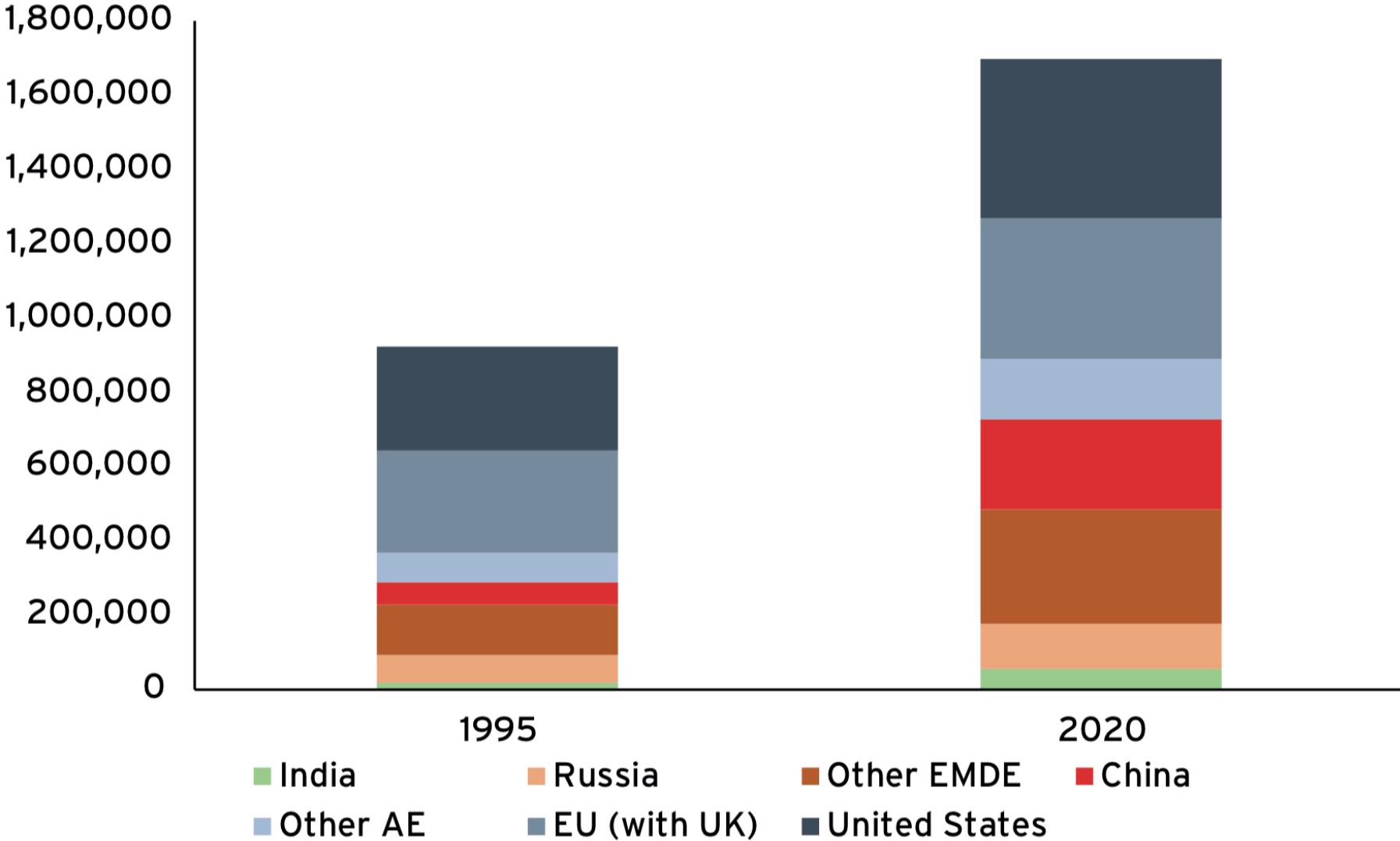


# I. Climate – thought experiment

1. Assignment: design a global carbon credit market
  - **There are 300 Gt left – allocate these emission rights and then trade**
    - Paris: to the current emitters
    - Alternatives:
      - Equal distribution per capita
      - Take into account past emissions
      - Take into account ease of avoidance
      - Take into account relative vulnerability
      - Other biodiversity services

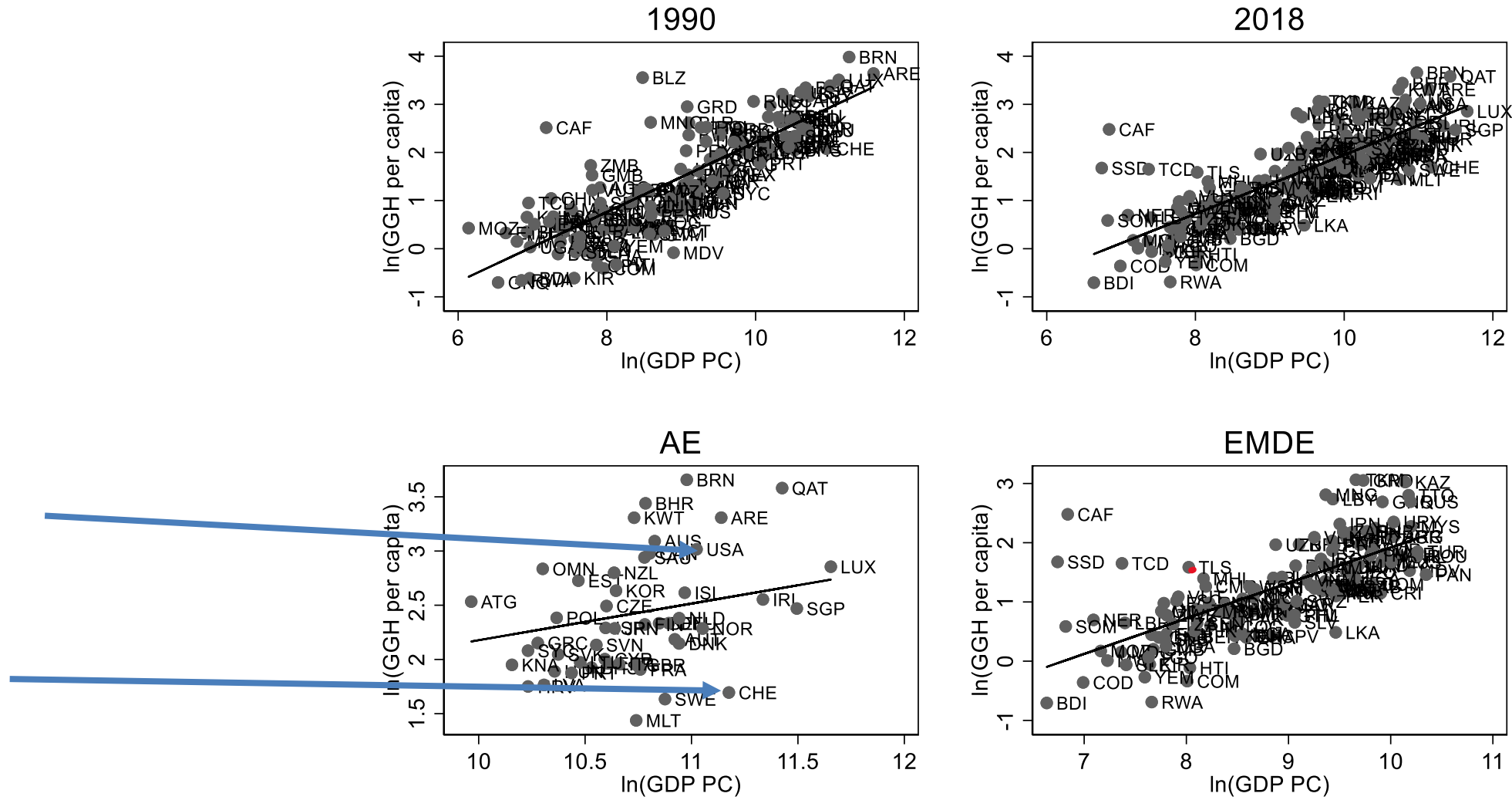
# I. Climate equity: Who did it?

FIGURE 1.2 CUMULATED CARBON EMISSIONS



# I. Climate equity

Rich emit more than poor, growth is mostly brown



Based on a regression capita carbon emissions (in logs) over the log of GDP per capita (real PPP at 2017 prices).

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## **II. Debt – Fiscal constraints in EMDEs**

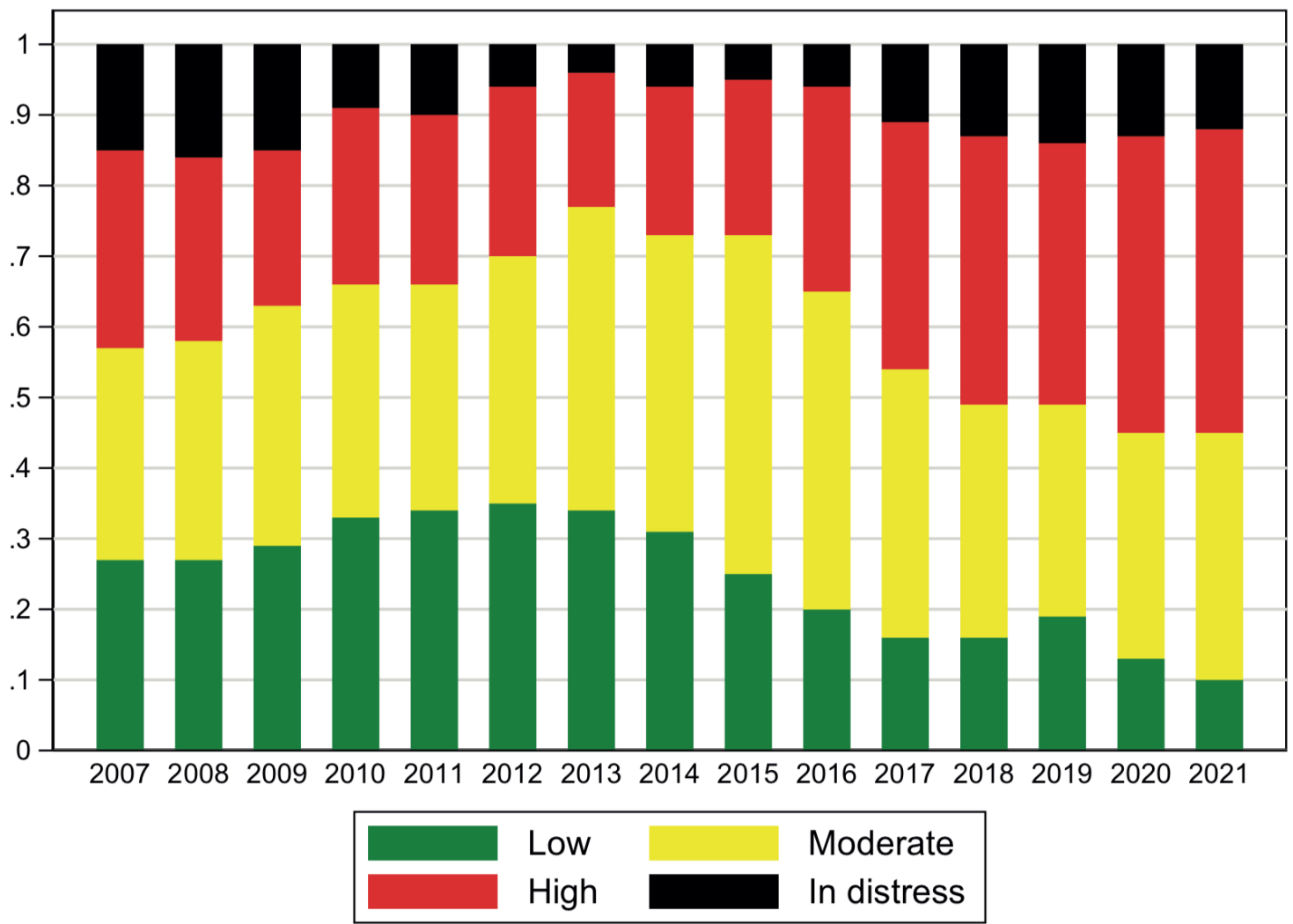
### **1. Estimates of fiscal need for adaptation**

Aligishiev et al., 2022: \$500 billion per year, or about 0.4% of AE GDP

### **2. Debt distress is already high**

# II. Debt – Fiscal constraints in LICs

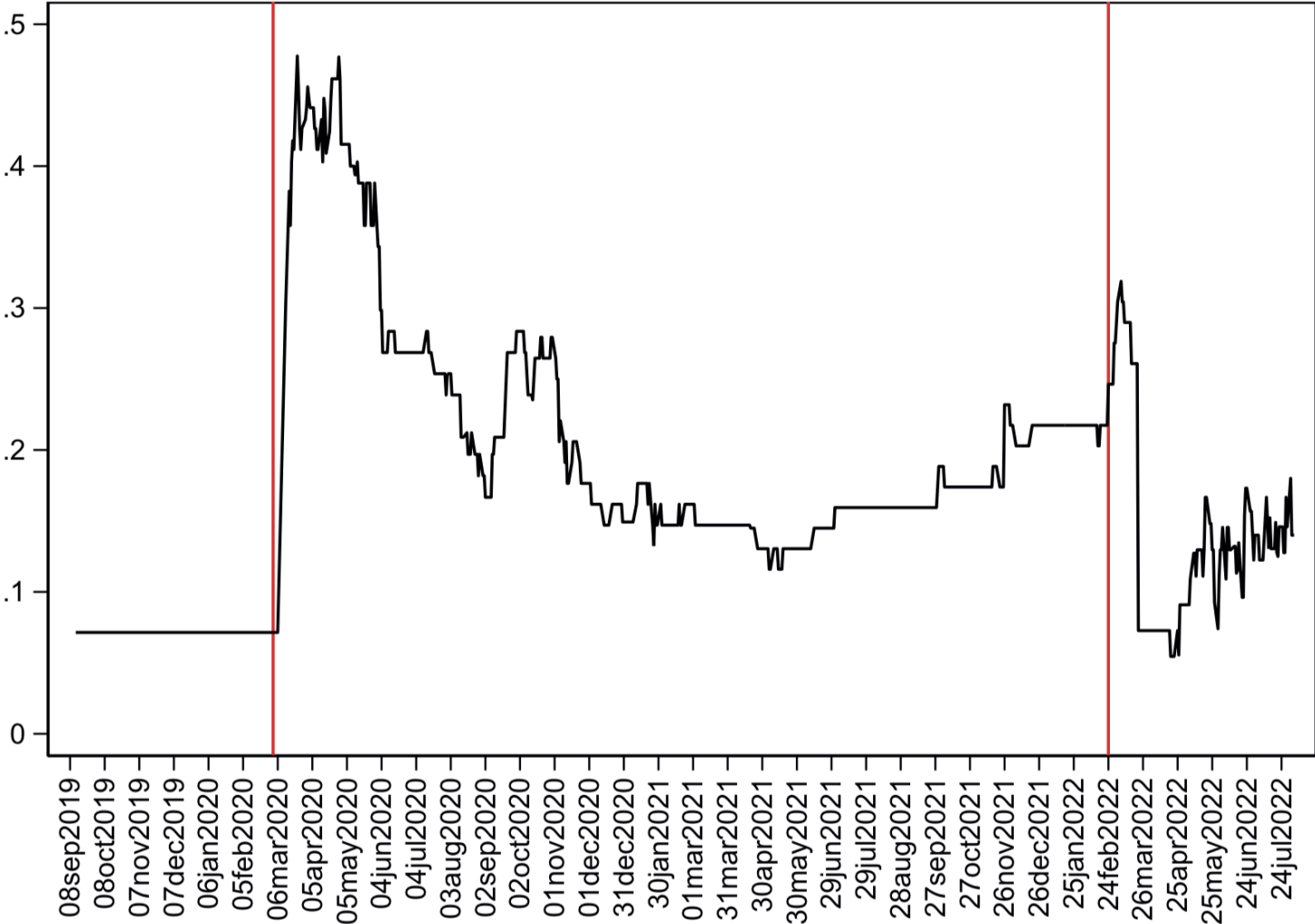
FIGURE 3.4 DEBT SUSTAINABILITY OVER TIME



300  
40  
60%  
6

Note: This figure plots the evolution of the share of PRGT-eligible countries (72 countries in total) classified as being at low, moderate, and high risk of debt distress on the basis of the External debt World Bank/IMF Debt Sustainability Framework.

**FIGURE 3.3 EMERGING AND DEVELOPING ECONOMIES WITH NO MARKET ACCESS**



Note: This figure plots the evolution of the share (black line) of emerging and developing economies with no market access (lack of market access is defined as having a spread above 750 basis points)

## II. Debt – Fiscal constraints in EMDEs

### 3. Climate change adds negative shocks

Fiscal deficits deteriorate significantly more in EMDEs than in AEs after a climate shock (with cost of 1% of GDP)

### 4. Spreads in EMDEs are highly susceptible to external shocks

About 6 times stronger spread reaction to a global shock than in AEs

### 5. EMDE spreads are increasingly sensitive to climate risk

Markets are increasingly pricing future climate risk (coefficient on spreads increases over time and is higher for predicted risks)

### 6. Pushing up borrowing costs

**Many EMDEs will not be able to finance the need adaptation investments**



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# III. Debt financing the green bond market

## Puzzles of the sovereign **green bonds**

1. **Additional green spending?** *Not really*
2. **A commitment to do something specific?**

Not really

3. **A way to signal to investors your intentions ?**

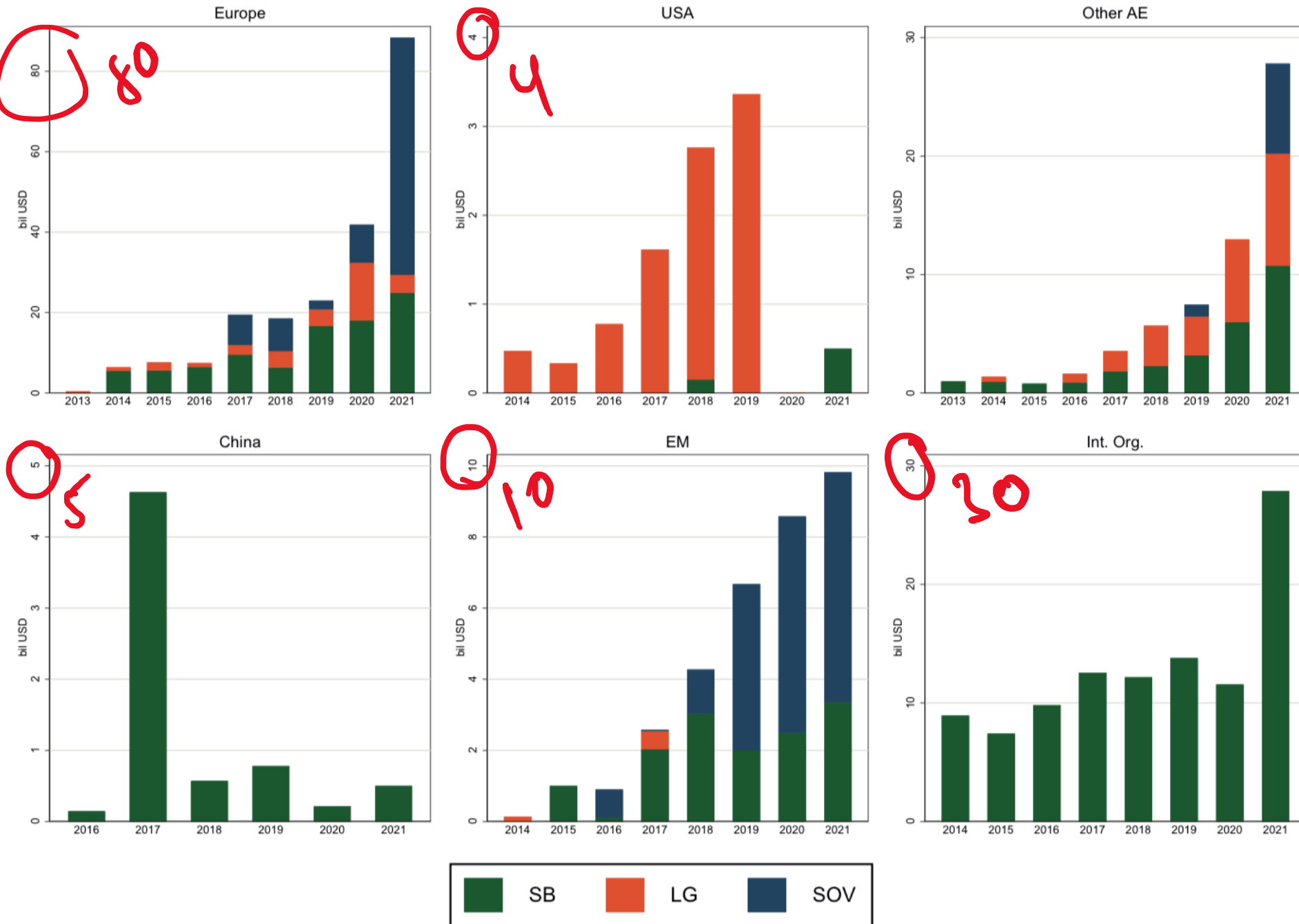
Sovereigns should have more direct means

Growth of green sovereign bonds:

Mostly in Europe  
In euro

SB (sovereign backed)  
LG (Local gov)

FIGURE 4.2 SOVEREIGN AND QUASI-SOVEREIGN BOND ISSUANCES BY GEOGRAPHIC AREA



# III. Looking for the greenium

## 1. Greenium – definition

*Issuer point of view: positive greenium*

*= lower financing = difference brown - green bond*

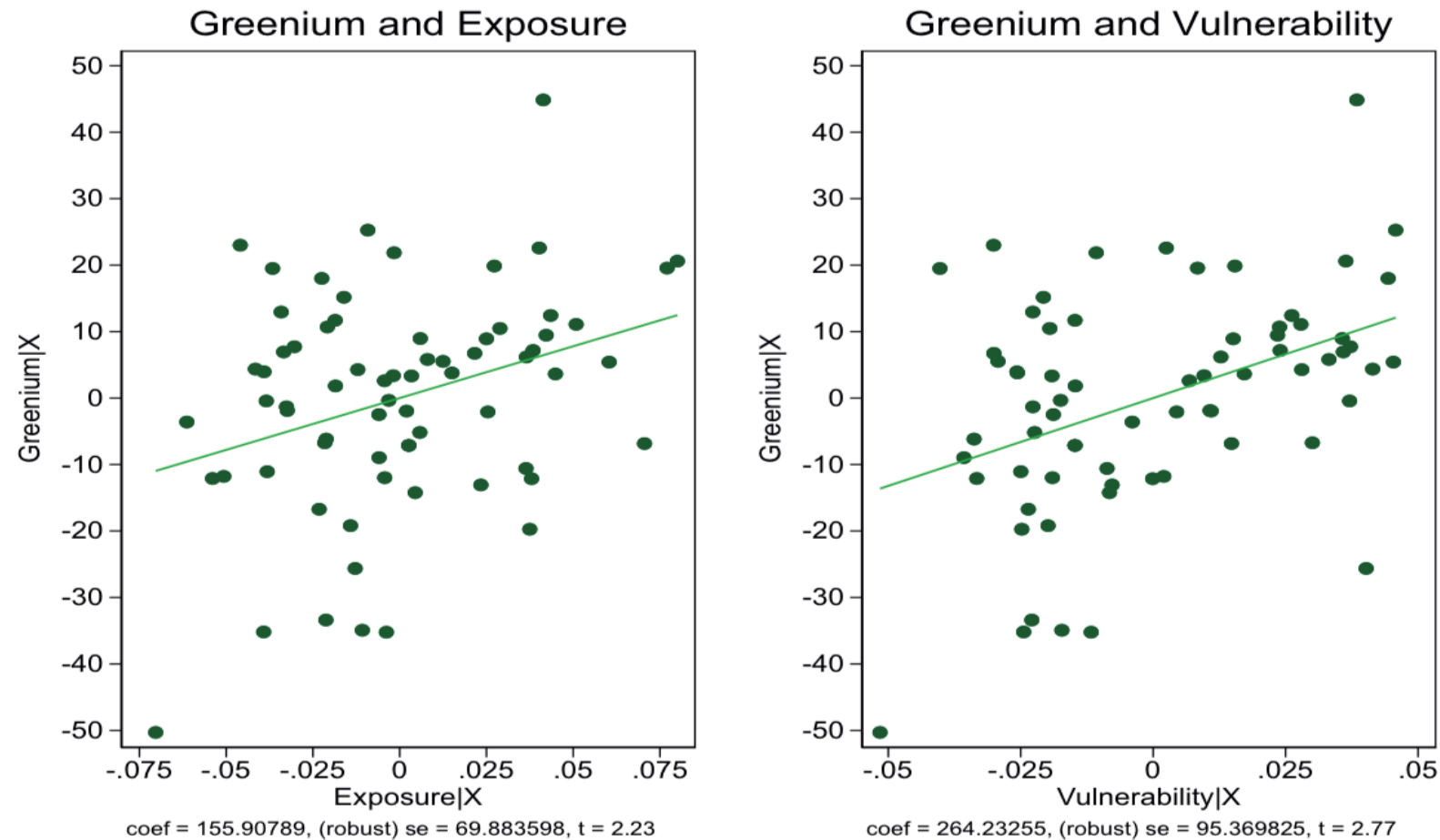
## 2. Is it positive ?

*Our finding: negative Greenium (5 bp) in AEs , not significant in EMDEs*

## 3. But it varies with climate risk

# III. But it is higher in countries with higher risk: Markets “reward” green finance

FIGURE 4.3 PARTIAL CORRELATION BETWEEN THE GREENIUM AND CLIMATE RISK



Note: This figure plots the partial correlation between greenium and climate risk based on the results of columns 2 and 3 in Table 4.3

### III. Looking for the commitment – ask the lawyers

#### The Hungarian Green bond 2021

*While it is the intention of the Issuer to apply the proceeds from the placement to finance or refinance Eligible Green Expenditures, it is under no legal obligation to do so. There is also no legal obligation to ensure that such Eligible Green Expenditures will be available or capable of being implemented as anticipated and, accordingly, that the Issuer will be able to use the proceeds for such Eligible Green Expenditures as intended. In addition, there is no legal obligation to ensure that Eligible Green Expenditures will achieve the originally intended impacts (environmental, social or otherwise) or outcomes in the manner expected.<sup>34</sup>*

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### III. Credit for Climate Finance: The Economic Case For Carbon Credits

**Point 1.** some crucial economic activities, will not be replaced with renewable energy. Need for **offset** by carbon removal from the atmosphere

**Point 2** **Compulsory** Net Zero targets give emitters the choice to comply directly or indirectly by purchasing carbon credits - and the possibility to offset will mean less opposition to carbon emission reduction regulations.

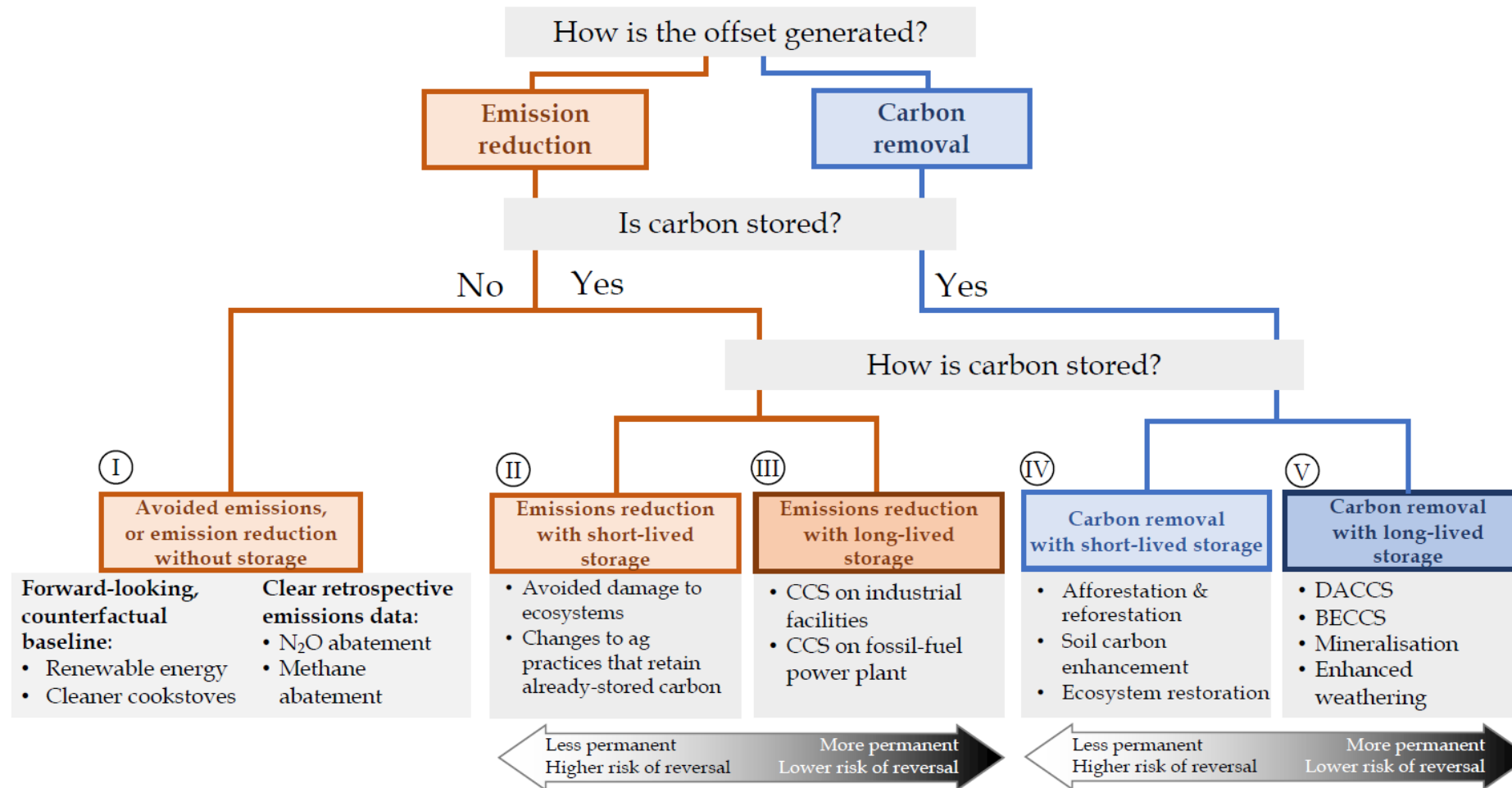
**Point 3** In an efficient carbon credit market, **any source of carbon emission reduction** should count as a carbon offset

**Point 4.** Incentivize carbon emission reductions, carbon emission avoidance, and carbon removal & sequestration worldwide

- Set up an important source of income for developing countries=> Not a donation, but an asset with market value



# III. Credit for Climate Finance: The Economic Case For Carbon Credits

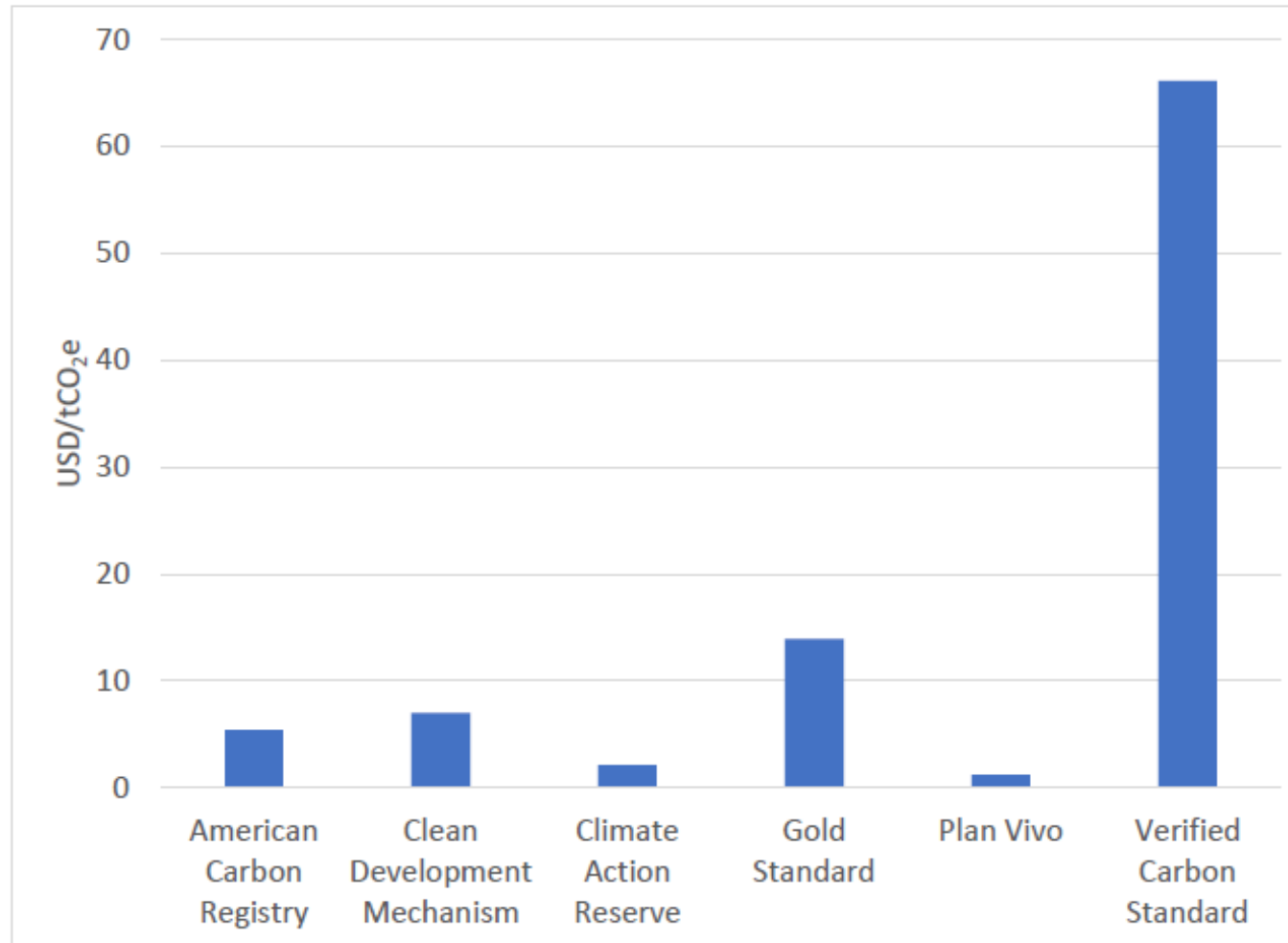


Source: Oxford Principles for Net Zero Aligned Carbon Offsetting (2020)

**Carbon Credits come in many shapes and sizes**

# III. Credit for Climate Finance: The Economic Case For Carbon Credits

Panel B. Offset Prices by Verification Standard, 2020



Source: Forest Trends' Ecosystem Marketplace 2021b.

## Carbon Credits: Market Fragmentation and Quality Issues

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### III. Debt restructuring and climate

Tinbergen (goals and instrument)

1. Debt for Climate Swaps – rarely optimal

*if goal is to provide room for climate finance - grants*

*if goal is to reduce debt - restructuring*

2. But climate conditionality in debt restructuring

*Debt exchange of conventional bonds for sustainability linked,*

*Climate risk and financing need in DSA,*

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# Policies

1. Create an institutional framework for a carbon credit market based on **mandatory** direct and indirect carbon emission reduction requirements for all large emitters.
2. Climate-**conditionality** in comprehensive debt restructurings and deeper haircuts with DSA that keeps into account climate risk: Exchange of conventional bonds for Sustainability Linked (market creation)
3. Set up a climate information and monitoring system to support the development of sustainability-linked sovereign bonds
4. Commit to an annual target for **fiscal support** for adaptation, mitigation and transition expenditures in developing and emerging market countries
5. Develop a clear legal framework and verification mechanisms that will enhance the credibility of green sovereign bonds.
6. Improve the design of debt-for-nature swaps.

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