

Nature as Capital

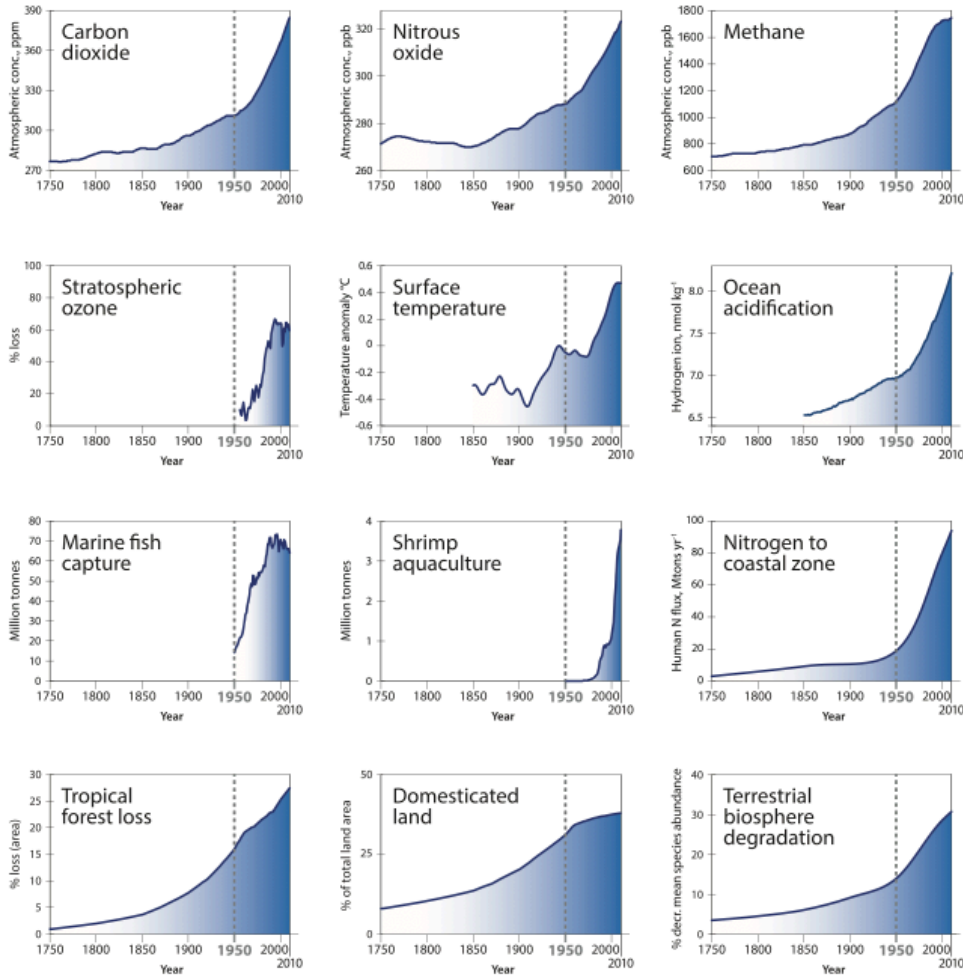
Scientific Co-Design of Nature-Positive Business Practices



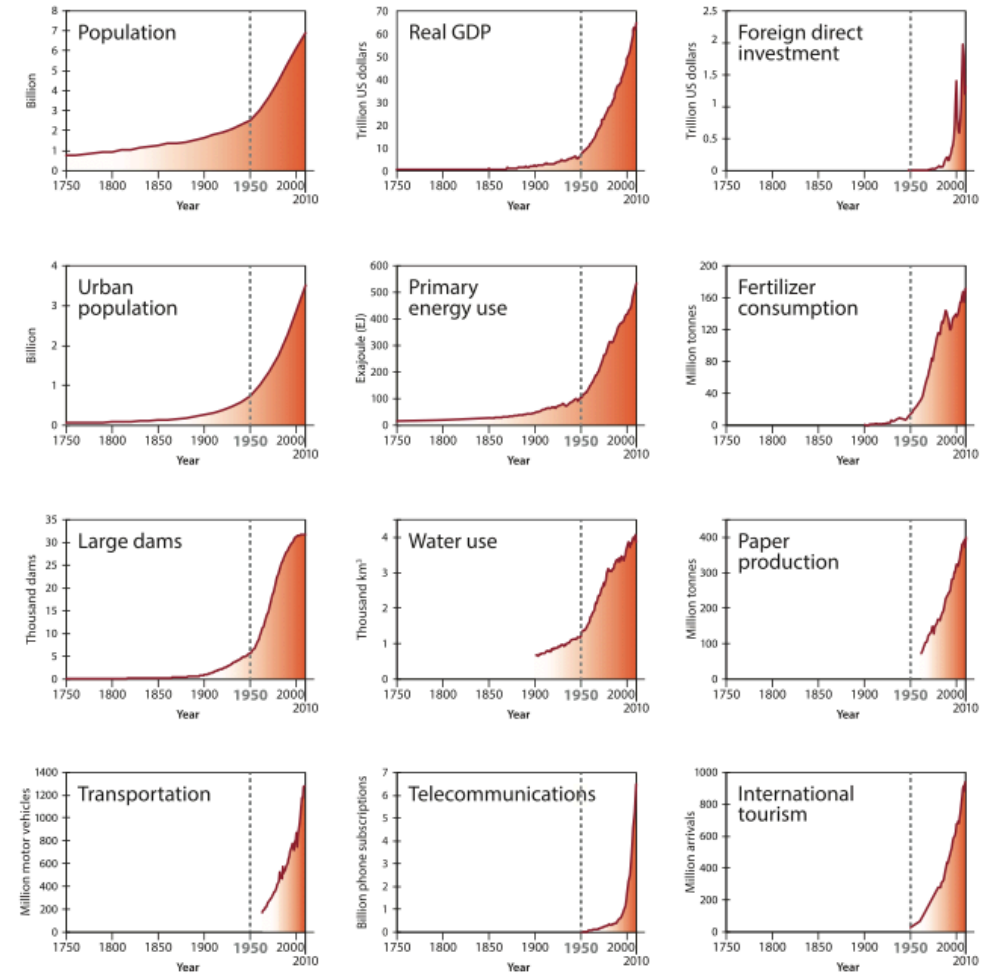


The anthropocene: The great acceleration

Earth system trends



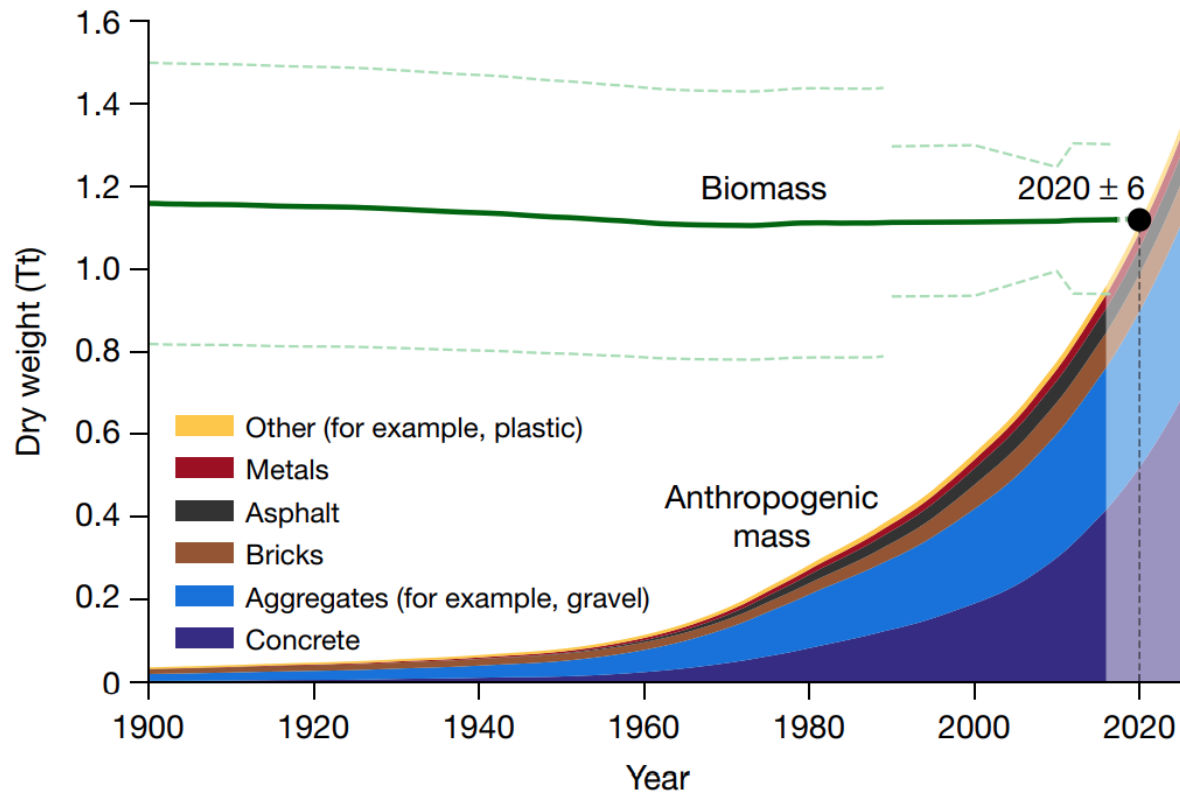
Socio-economic trends



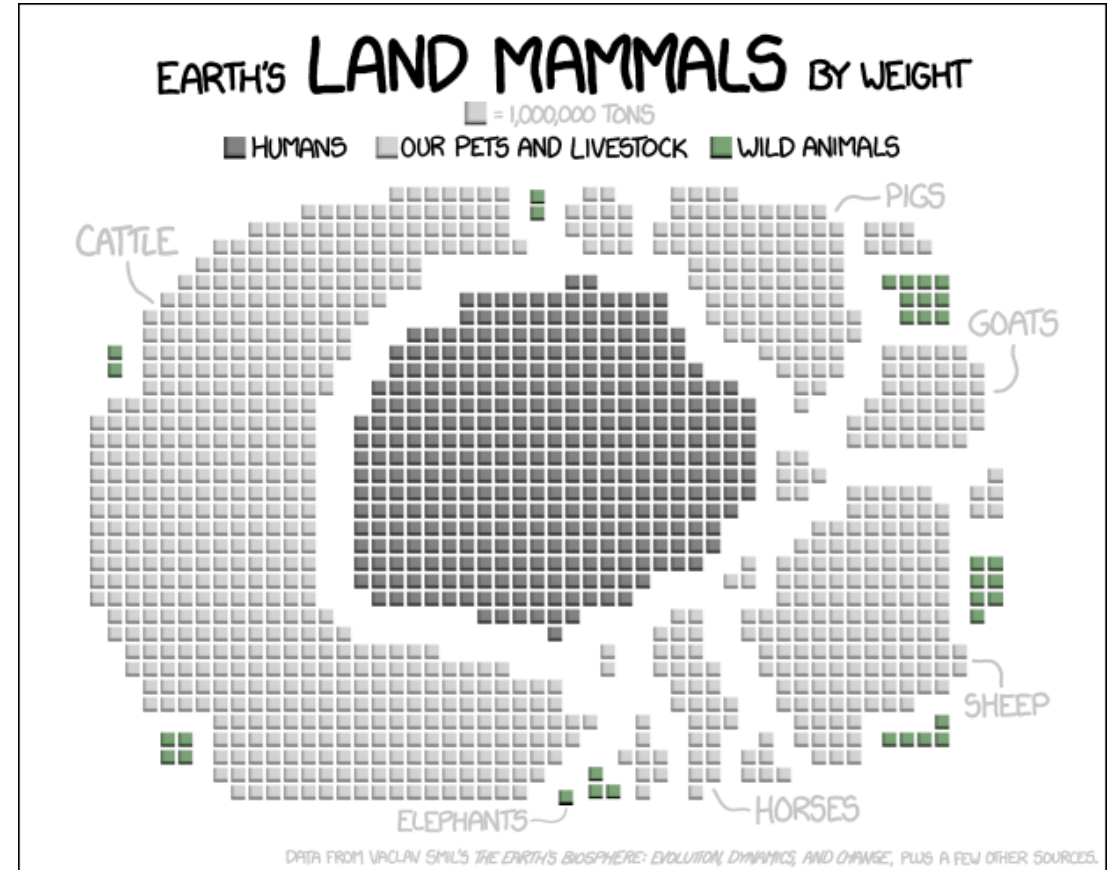
Steffen et al. The Anthropocene Review 2015



The anthropocene



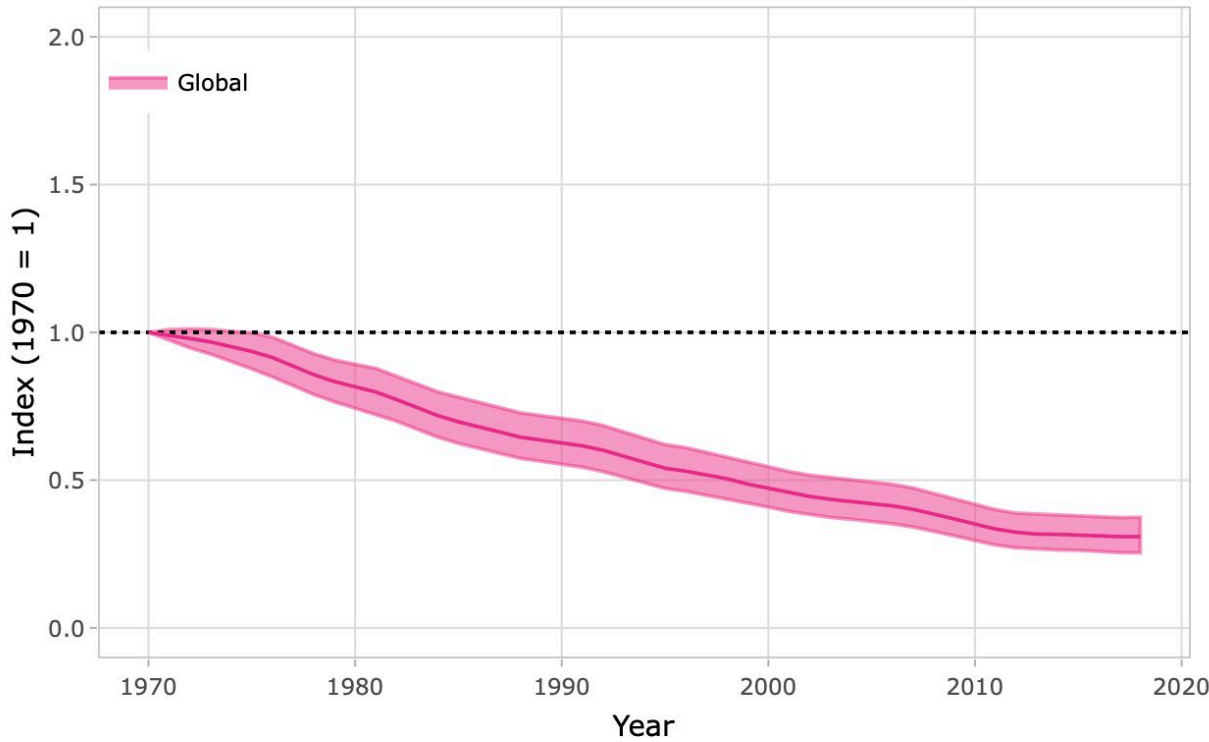
Elhacham et al 2020 Nature



Randall Munroe, XKCD ; Data from Vaclav Smil 2003, The Earth Biosphere

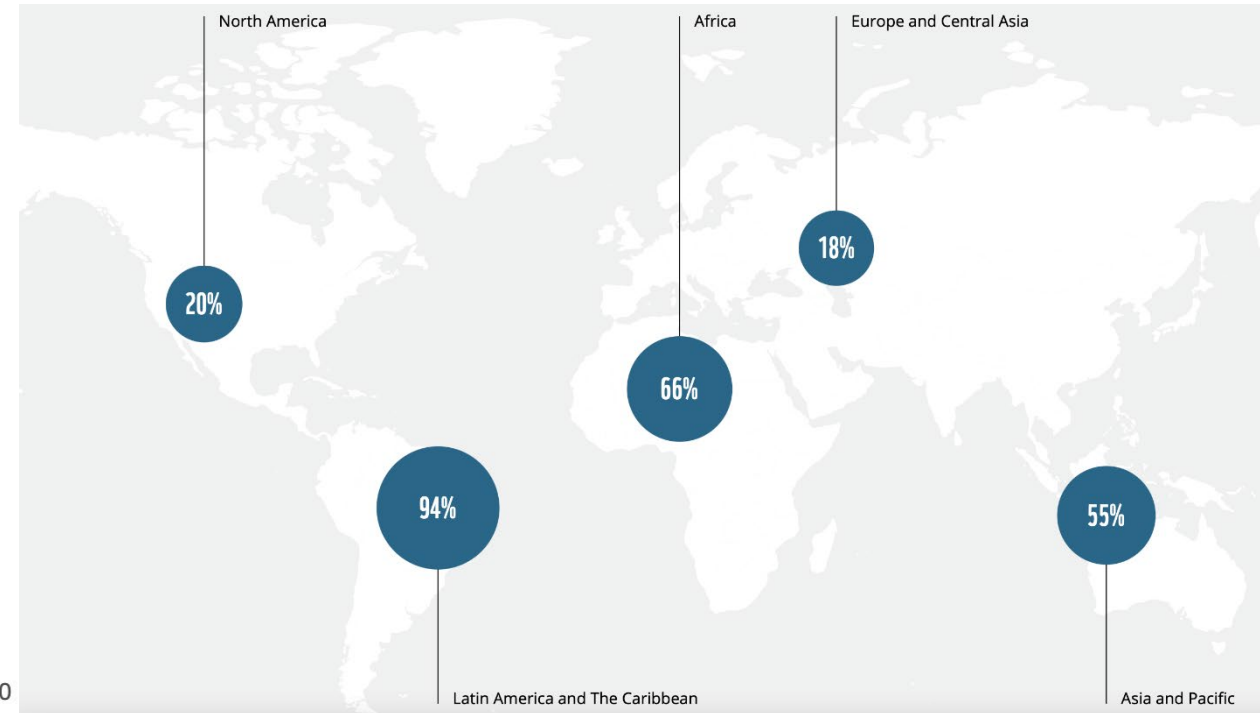


Global biodiversity loss since the 1970s



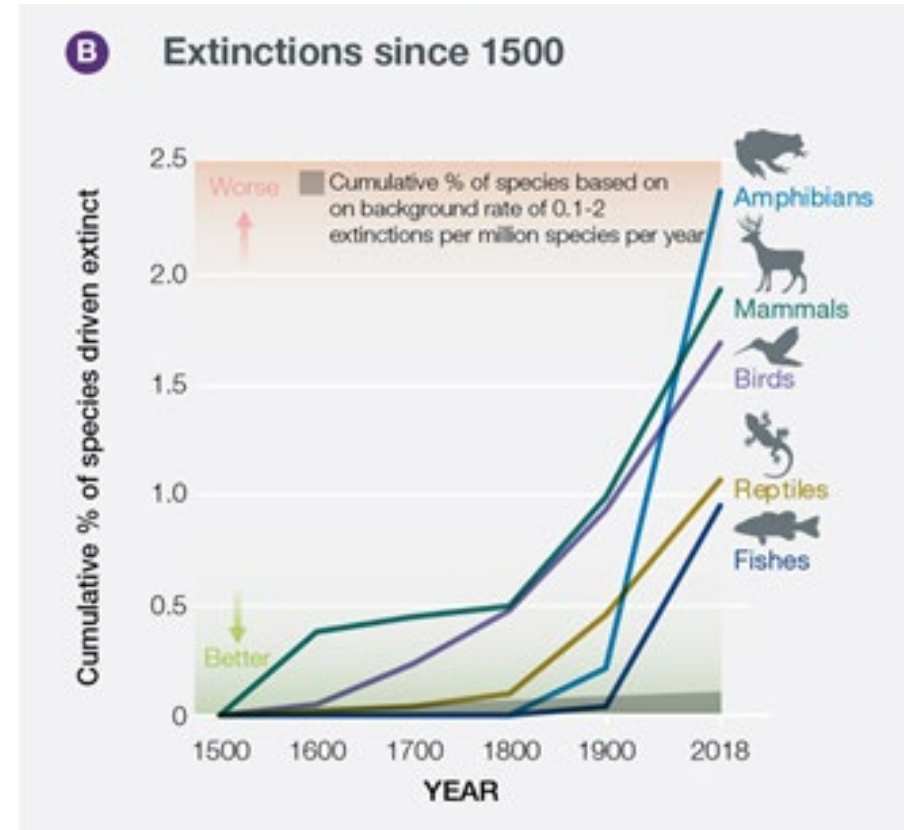
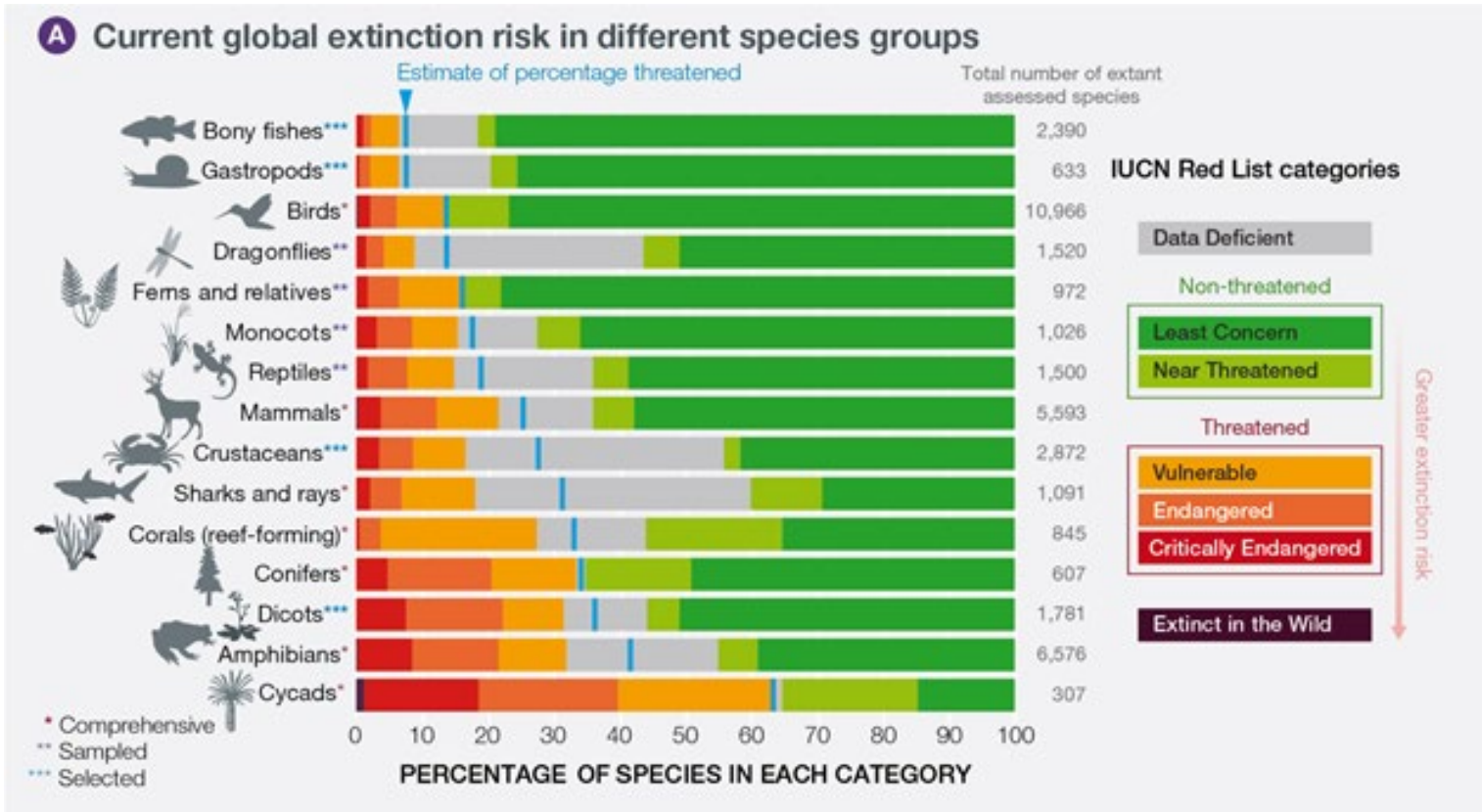
Data: Living Planet Report 2022, WWF/ZSL

Biodiversity loss by region





Global biodiversity loss



IPBES (2019) Global Assessment



Ecosystem Services

Regulating Services



Provisioning/Material Services



Cultural/Immaterial Services



	Nature's contribution to people	50-year global trend	Directional trend across regions	Selected indicator
REGULATION OF ENVIRONMENTAL PROCESSES	1 Habitat creation and maintenance	↓ ↓ ↓ ↓	○ ○ ○ ○	• Extent of suitable habitat • Biodiversity intactness
	2 Pollination and dispersal of seeds and other propagules	↓ ↓ ↓ ↓	○ ○ ○ ○	• Pollinator diversity • Extent of natural habitat in agricultural areas
	3 Regulation of air quality	↘ ↘ ↘ ↘	↑ ↑	• Retention and prevented emissions of air pollutants by ecosystems
	4 Regulation of climate	↘ ↘ ↘ ↘	↑ ↑	• Prevented emissions and uptake of greenhouse gases by ecosystems
	5 Regulation of ocean acidification	↘ ↘ ↘ ↘	↑ ↑	• Capacity to sequester carbon by marine and terrestrial environments
	6 Regulation of freshwater quantity, location and timing	↘ ↘ ↘ ↘	↑ ↑	• Ecosystem impact on air-surface-ground water partitioning
	7 Regulation of freshwater and coastal water quality	↘ ↘ ↘ ↘	○ ○ ○ ○	• Extent of ecosystems that filter or add constituent components to water
	8 Formation, protection and decontamination of soils and sediments	↘ ↘ ↘ ↘	↑ ↑	• Soil organic carbon
	9 Regulation of hazards and extreme events	↘ ↘ ↘ ↘	↑ ↑	• Ability of ecosystems to absorb and buffer hazards
	10 Regulation of detrimental organisms and biological processes	↓ ↓ ↓ ↓	○ ○ ○ ○	• Extent of natural habitat in agricultural areas • Diversity of competent hosts of vector-borne diseases
MATERIALS AND ASSISTANCE	11 Energy	↘ ↘ ↘ ↘	↑ ↑	• Extent of agricultural land—potential land for bioenergy production • Extent of forested land
	12 Food and feed	↓ ↓ ↓ ↓	↑ ↑	• Extent of agricultural land—potential land for food and feed production • Abundance of marine fish stocks
	13 Materials and assistance	↘ ↘ ↘ ↘	↑ ↑	• Extent of agricultural land—potential land for material production • Extent of forested land
	14 Medicinal, biochemical and genetic resources	↘ ↘ ↘ ↘	○ ○ ○ ○	• Fraction of species locally known and used medicinally • Phylogenetic diversity
NON-MATERIAL	15 Learning and inspiration	↓ ↓ ↓ ↓	○ ○ ○ ○	• Number of people in close proximity to nature • Diversity of life from which to learn
	16 Physical and psychological experiences	↘ ↘ ↘ ↘	○ ○ ○ ○	• Area of natural and traditional landscapes and seascapes
	17 Supporting identities	↘ ↘ ↘ ↘	○ ○ ○ ○	• Stability of land use and land cover
	18 Maintenance of options	↓ ↓ ↓ ↓	○ ○ ○ ○	• Species' survival probability • Phylogenetic diversity

Decrease ← → Increase

DIRECTIONAL TREND

Global trends: ↓ ↘ ↙ ↗ ↕

Across regions: ○ Consistent ↕ Variable

LEVELS OF CERTAINTY

● Well established

● Established but incomplete

● Unresolved



Risks for companies: Dependence on biodiversity

BIODIVERSITY in numbers



Humans depend on nature and its services for more than half of the world's GDP, **US \$44 trillion**.



Up to **US \$1.0 tn** in investment per year is needed to protect and conserve biodiversity.

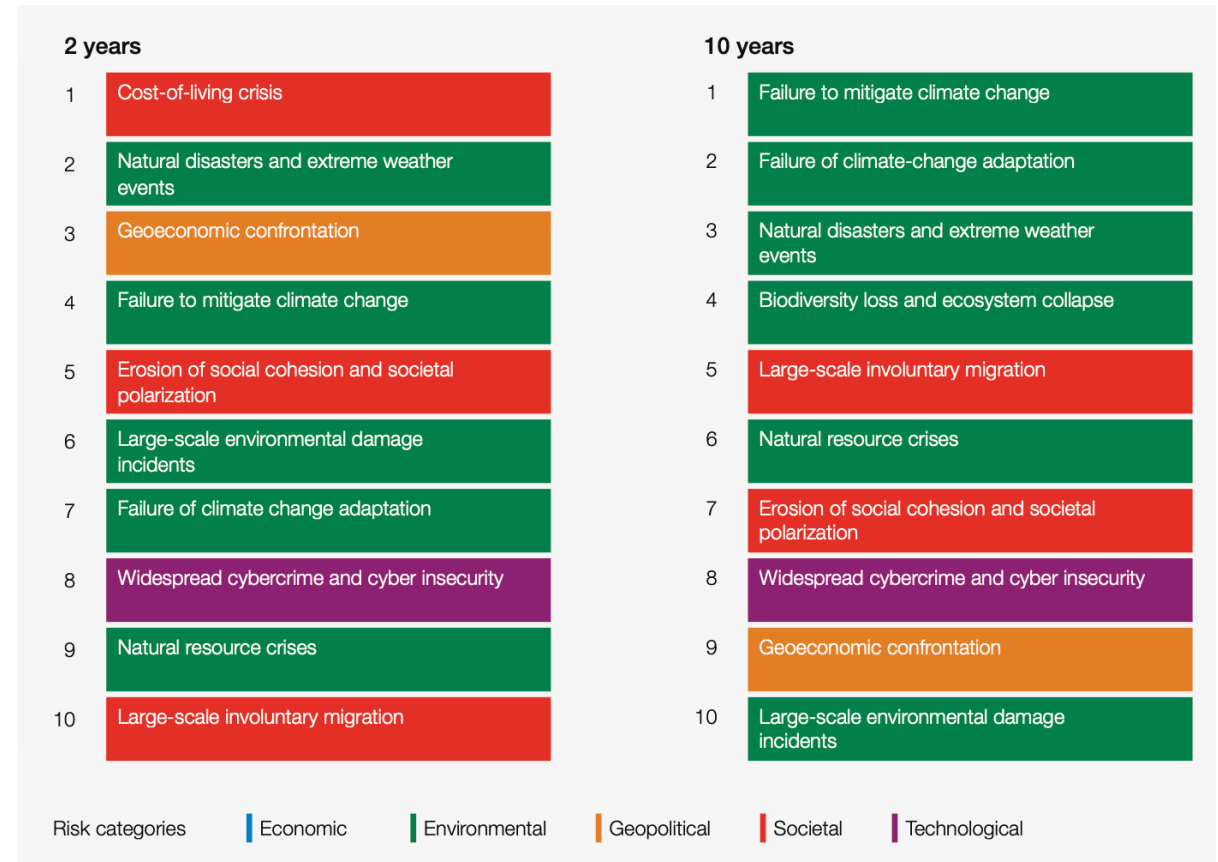


Current financing for biodiversity conservation and remediation represent less than **10%** of the need.



An incremental **US \$0.6 - \$0.9 trillion** is needed per year to improve biodiversity on the path to fully thriving nature.

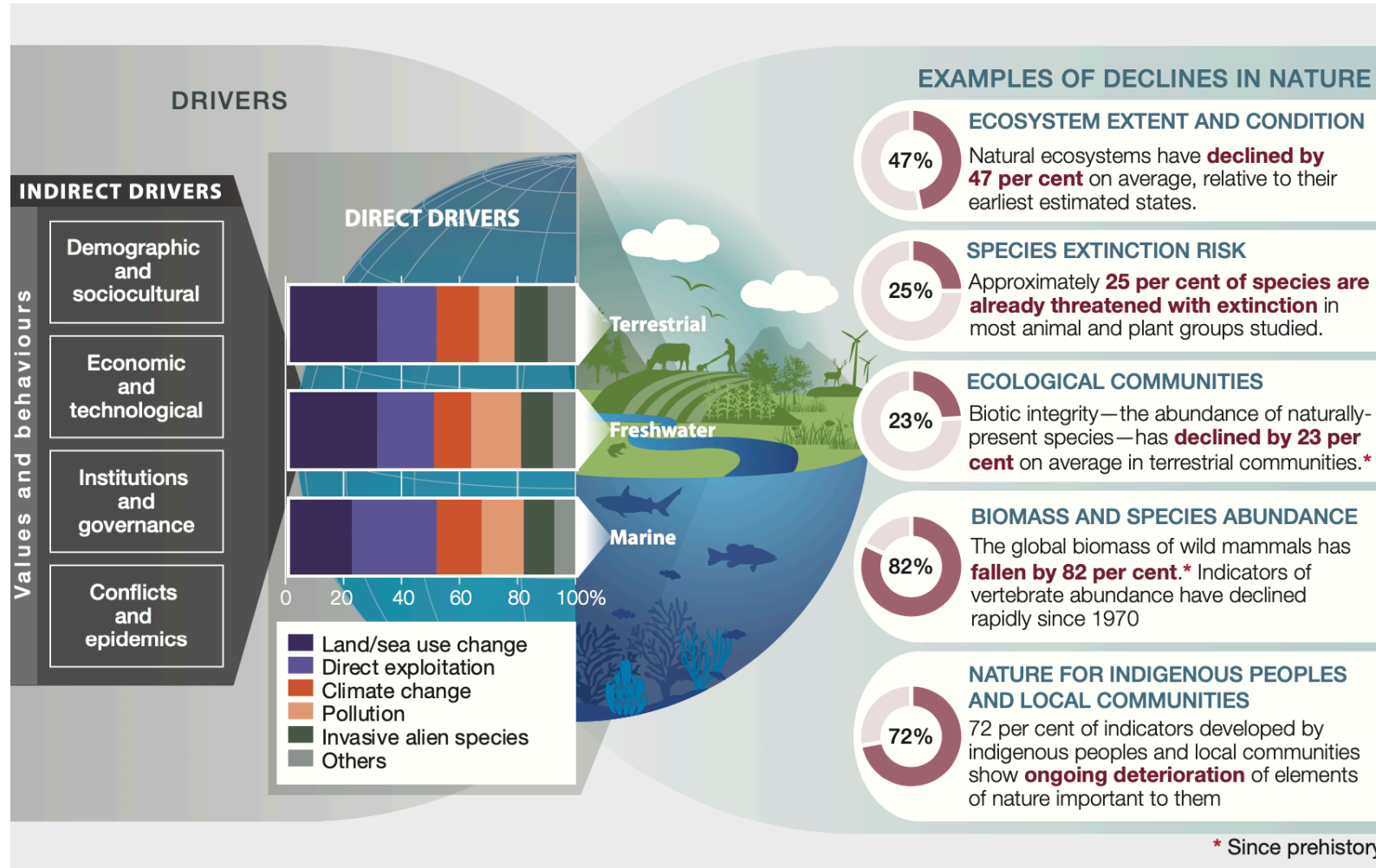
GS Sustain 2022, Goldman Sachs



Global risks ranked by severity over the short and long term
(Risk Report 2023, World Economic Forum)



Causes of biodiversity loss





Time to act! Transformation potential of companies

Sustainable production



Sustainable supply chain



Reporting

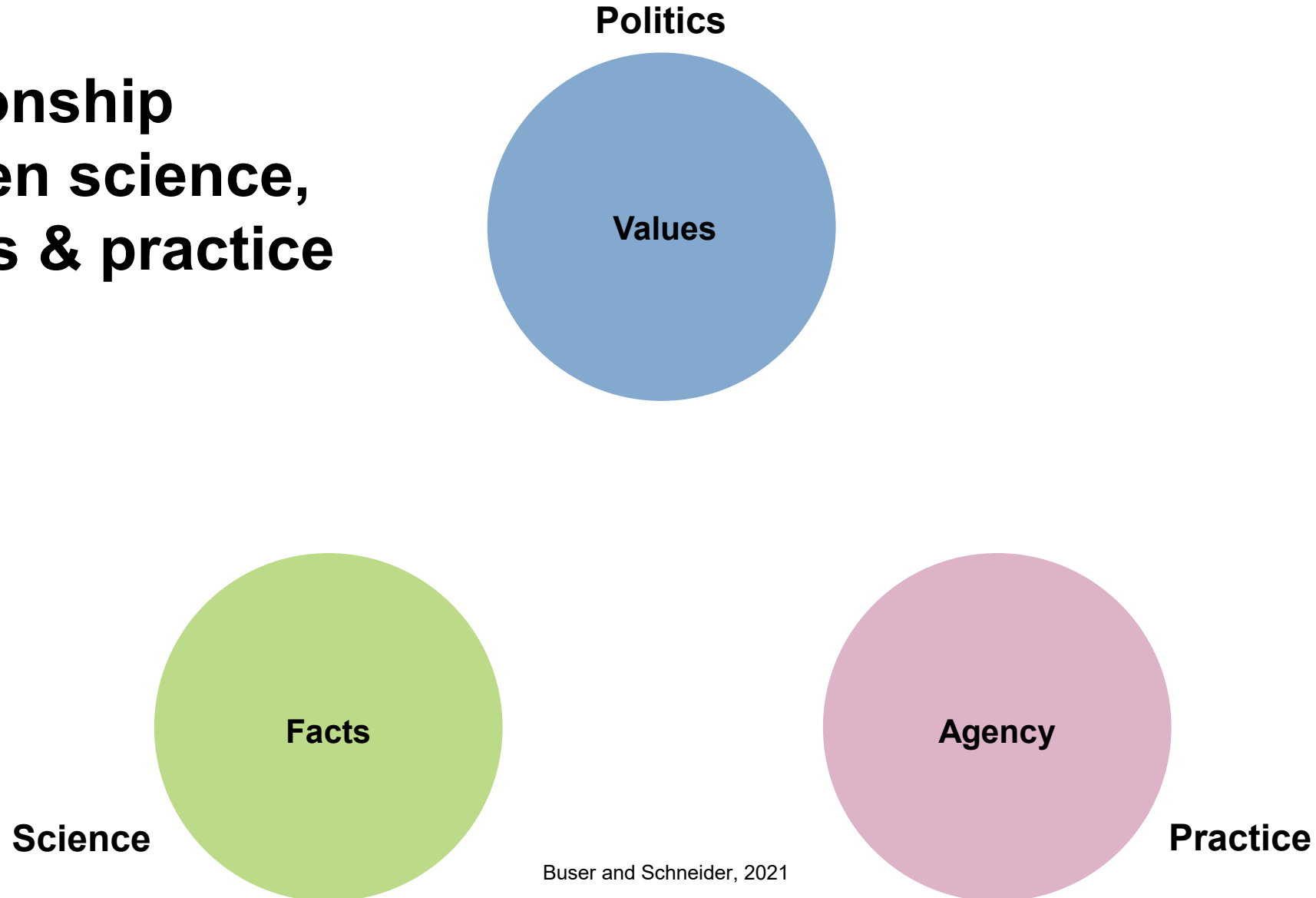


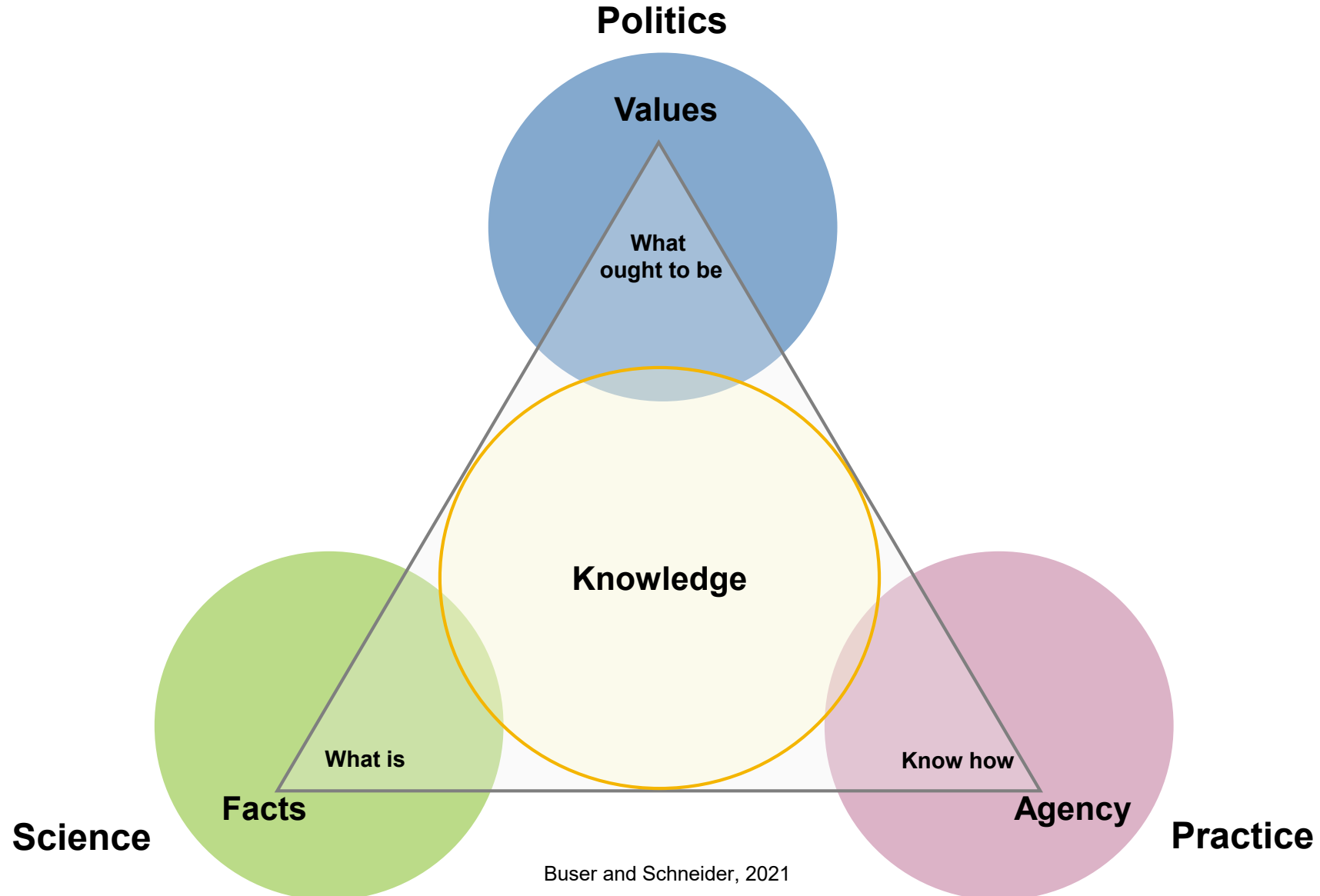
Corporate social responsibility

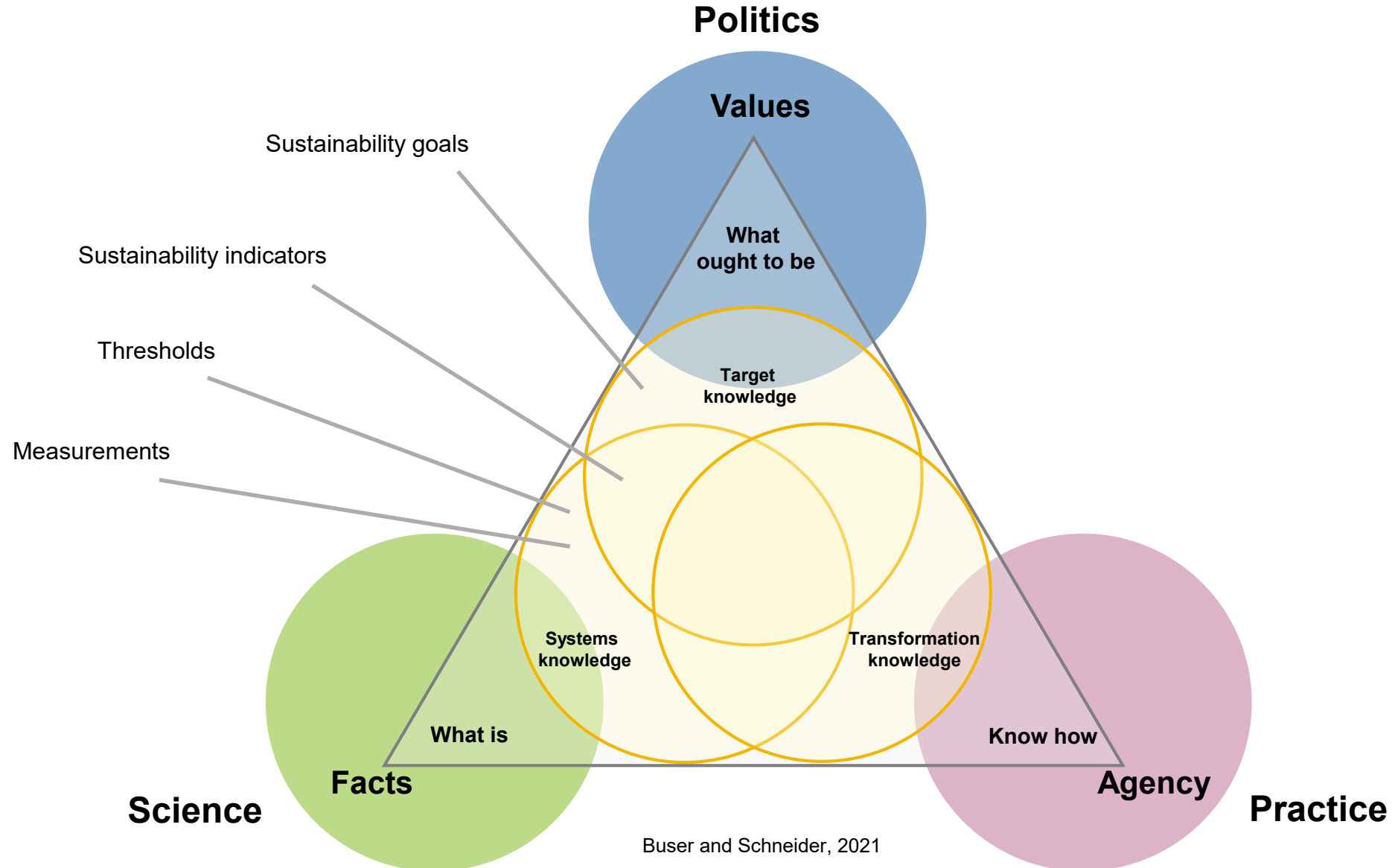


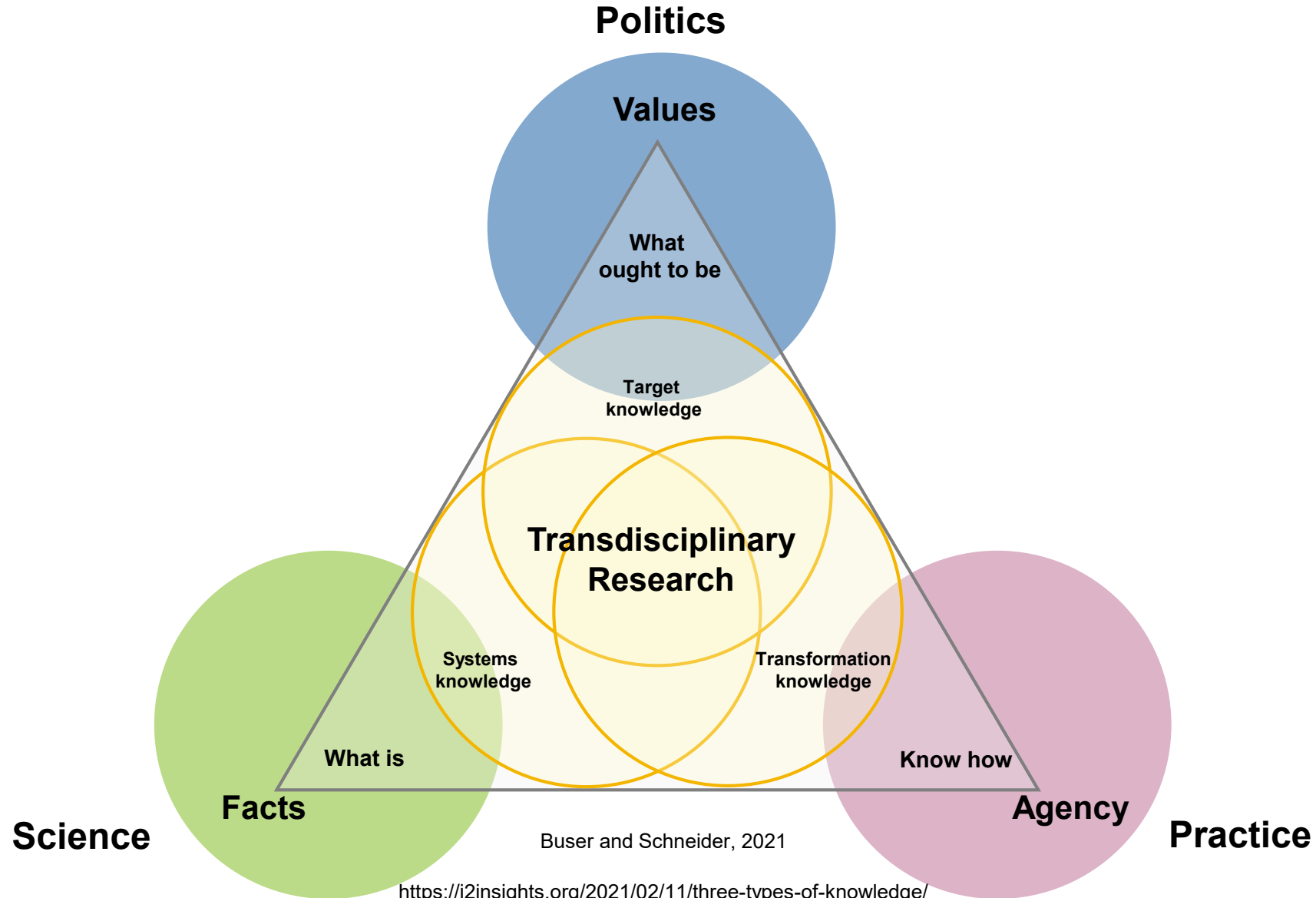


**Relationship
between science,
politics & practice**











BiolImpact: Assessing the biodiversity footprint of companies

New joint project linking biodiversity research and the private sector

Aim: Develop and provide a service for assessing and evaluating biodiversity impacts of companies

Funded through the state of Hesse (“Digital innovation products”)

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BiolImpact: Assessing the biodiversity footprint of companies

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Product design:



Research institutes:





BiolImpact: Assessing the biodiversity footprint of companies

Work packages:

1. **Develop scientifically based metrics** to measure the impacts of business activities on biodiversity

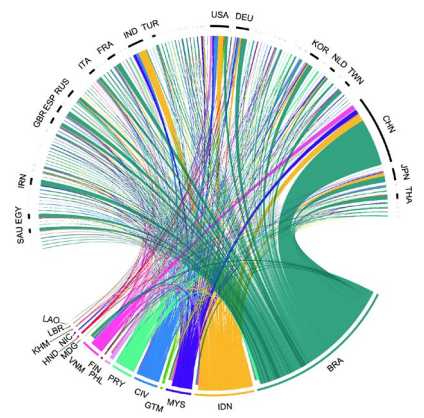
(Academic partners: University of Giessen + Senckenberg)

2. **Develop a marketable Product** to account for business impacts on biodiversity

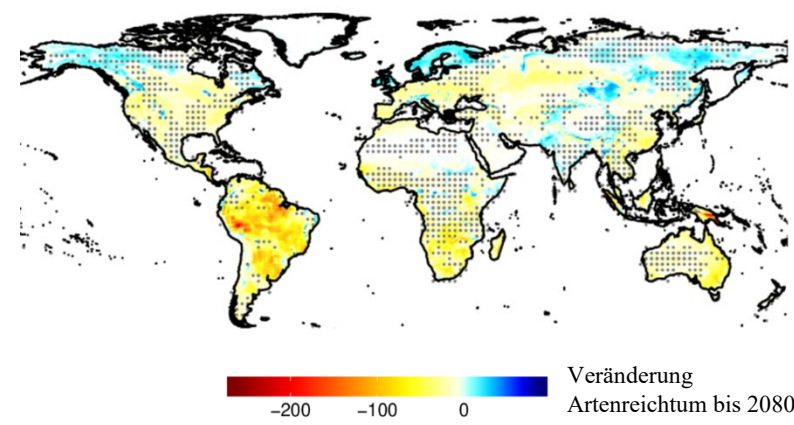
(right. based on science)



BiolImpact: Assessing the biodiversity footprint of companies



Land-use change
(Production areas)



Climate change
(Emissions)



Invasive species
(International transport)

Schwarz Müller & Kastner 2022, Sustainability Science, Hof et al 2018, PNAS



Business for Biodiversity:

T-Labs as experimental spaces to foster social-ecological transformation

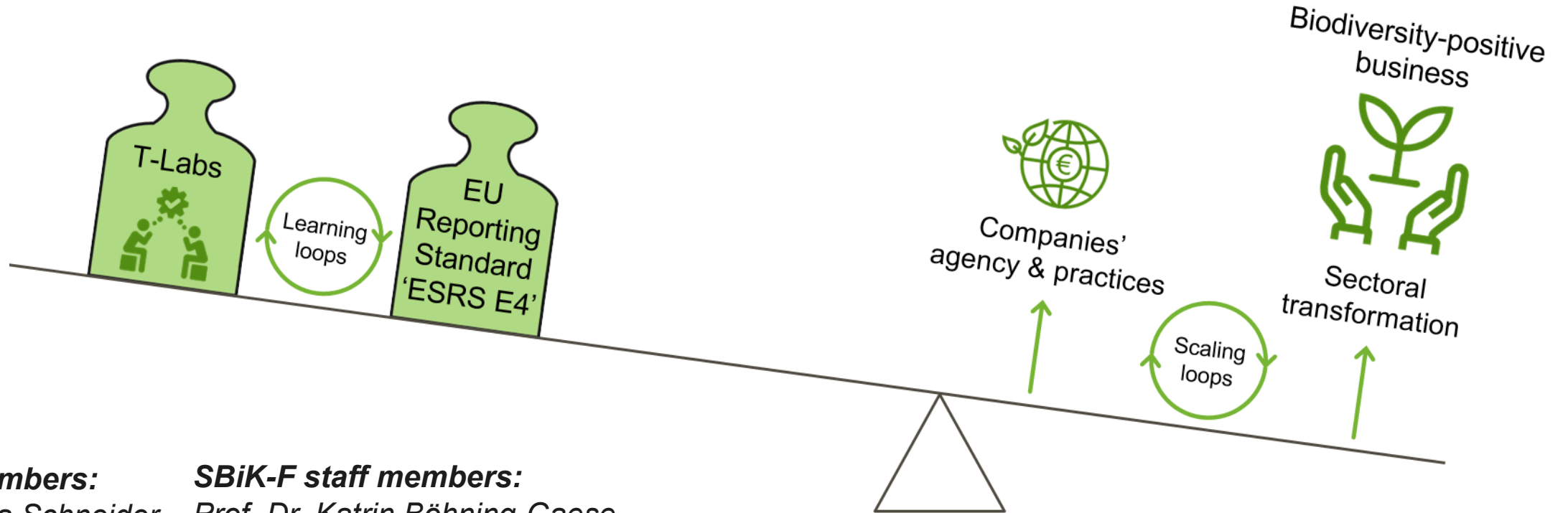
Targets

- Identify leverage points for biodiversity-enhancing business practices through transdisciplinary research.
- Strengthen corporate commitment to biodiversity-enhancing practices.



Business for Biodiversity:

T-Labs as experimental spaces to foster social-ecological transformation



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