UN environment programme

International Resource Panel

GLOBE EUROPEAN UNION

The Network for Environmental Legislators

Global Resource Outlook 2024

Bend the Trend

Pathway to a Liveable Planet as Resource Use Spikes

JANEZ POTOČNIK

Co-Chair International Resource Panel - IRP

Partner SYSTEMIQ

Member Club of Rome

Brussels, 5th March 2024

For the first time in a human history, we face the emergence of a single, tightly coupled human social-ecological system of planetary scope.

We are more interconnected and interdependent than ever.

Our individual and collective responsibility has enormously increased.

Climate Change

Received most of the attention by policy makers last decades

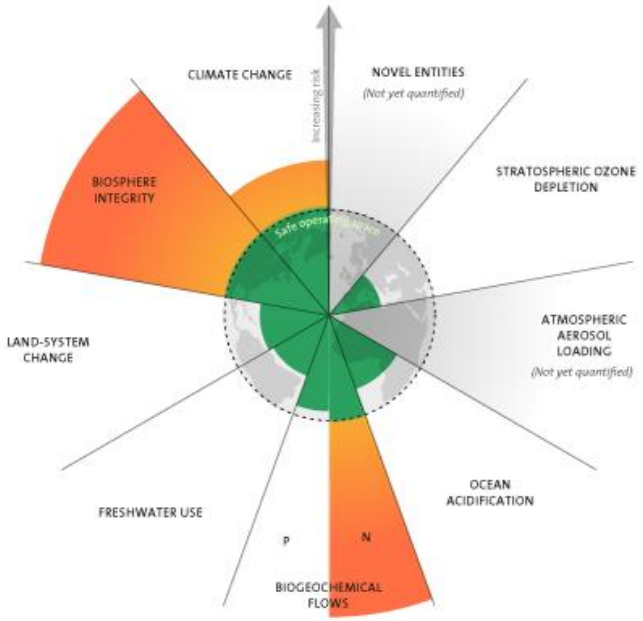
With good reasons, but limited success

Some Climate Change Related Facts

- *Global CO_2 emissions in billion metric tonnes 37.55 (Source: Statista 2023)*
- *Global surface temperature increase above pre-industrial level 1.48 degrees Celsious (Source Copernicus 2023)*
- *Fossil fuel subsidies $7 trillion or 7.1 percent of GDP (Source: IMF 2022)*
- *Annual economic losses due to climate extreme weather events increasing (Multiple sources)*

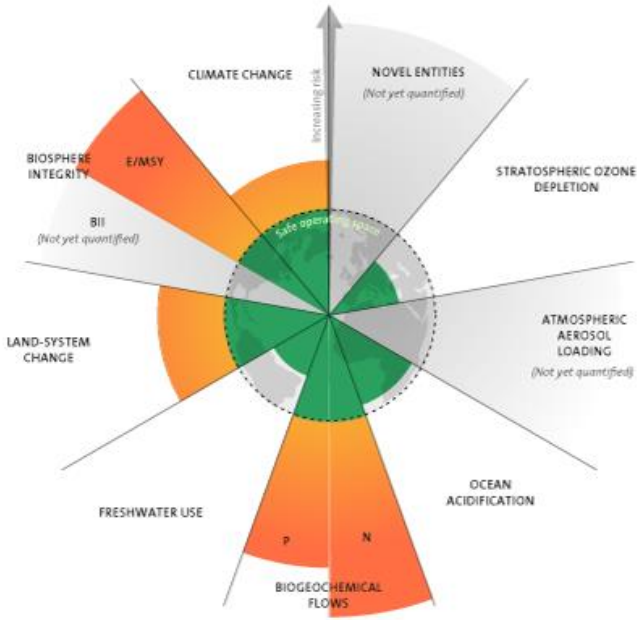
All obove data are the highest in the history for the last recorded year

2009



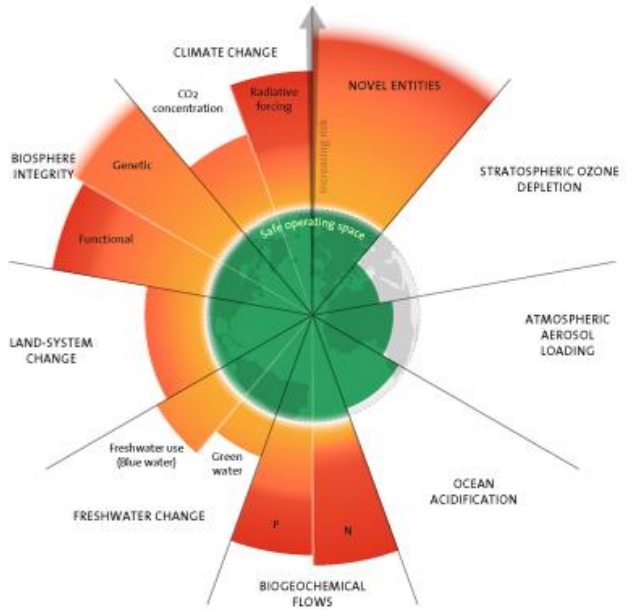
3 boundaries crossed

2015



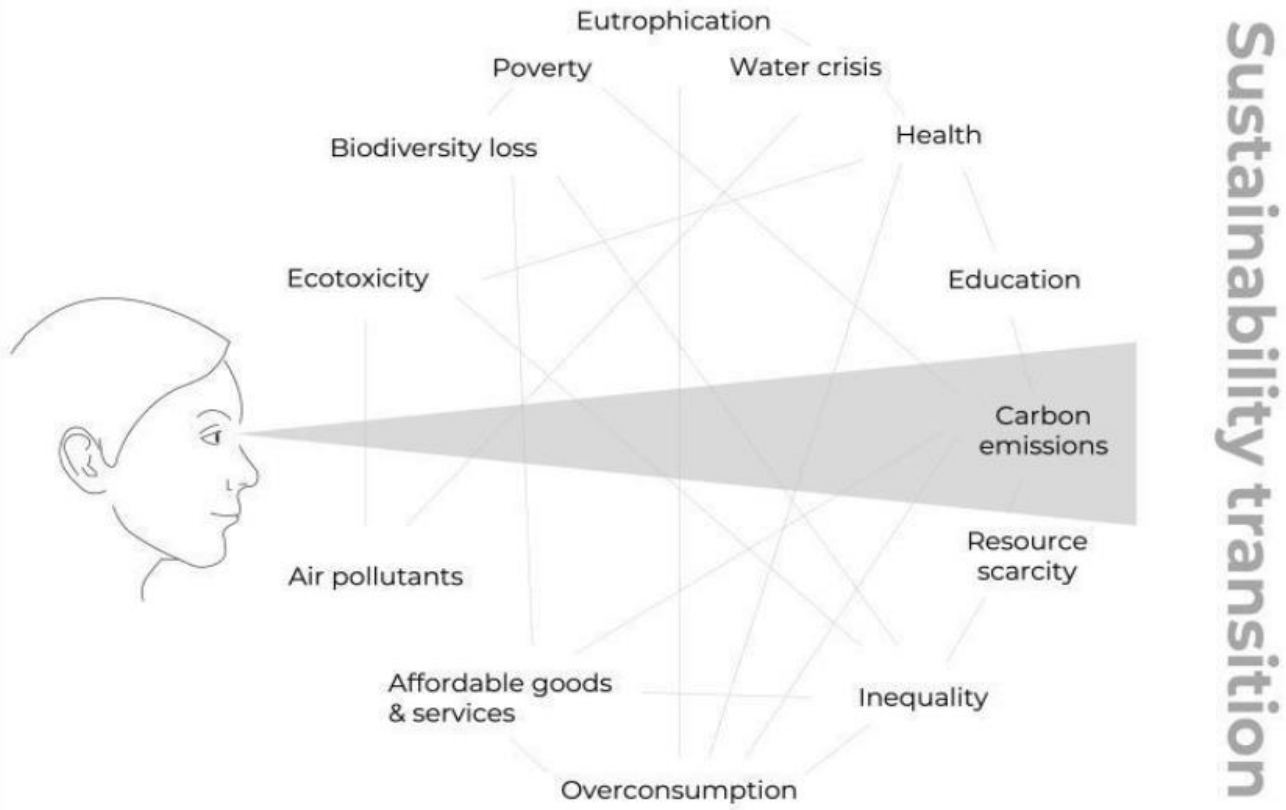
4 boundaries crossed

2023



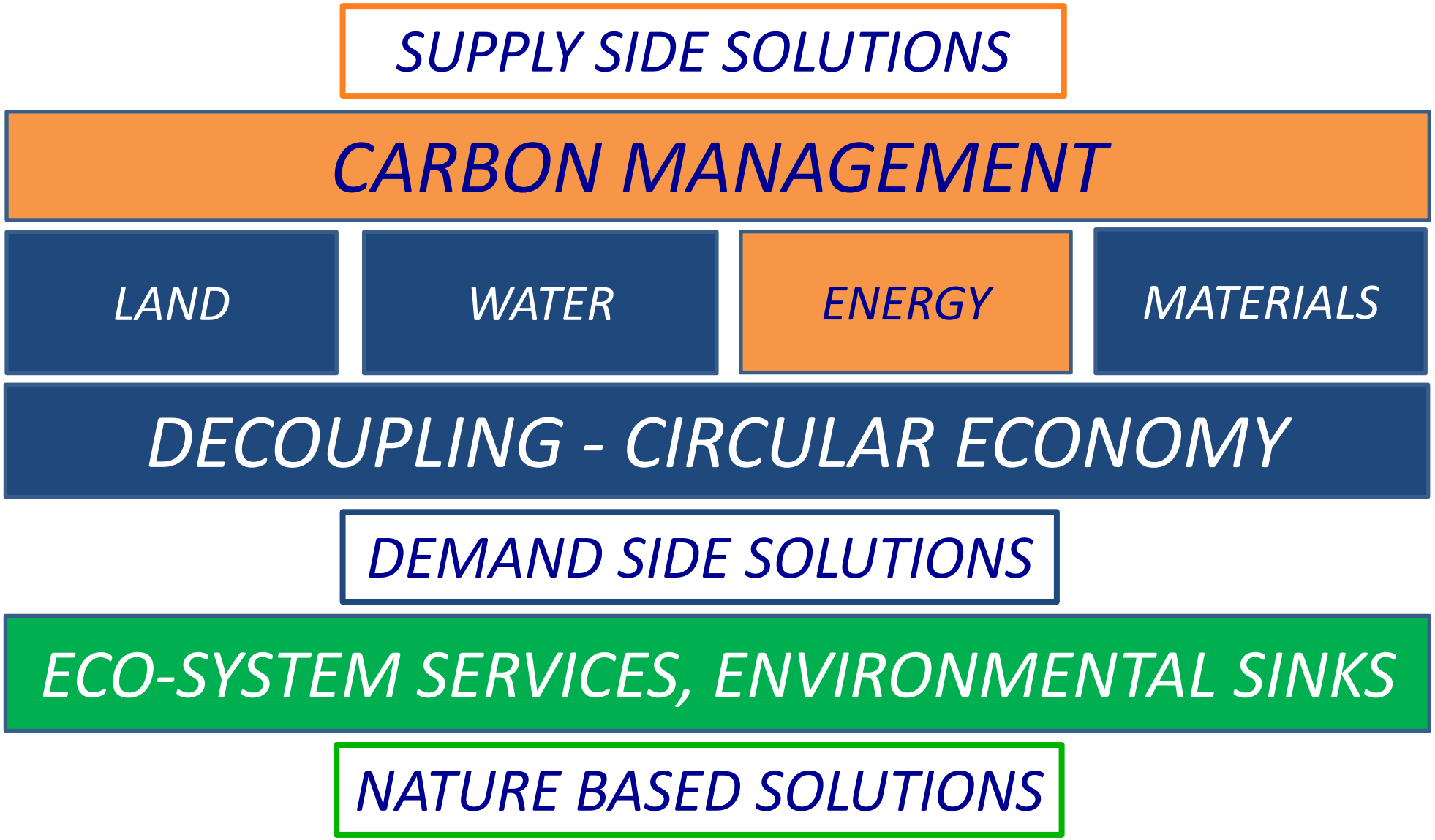
6 boundaries crossed

Source: Azote for Stockholm Resilience Centre, based on analysis in Richardson et al 2023



Discussion of climate often centres on carbon emissions, while a focus on overshoot highlights the materials usage, waste output and growth of human society … all of which affect the Earth's biosphere.

Climate Change can only be effectively addressed by combining



Resources - The Missing Link

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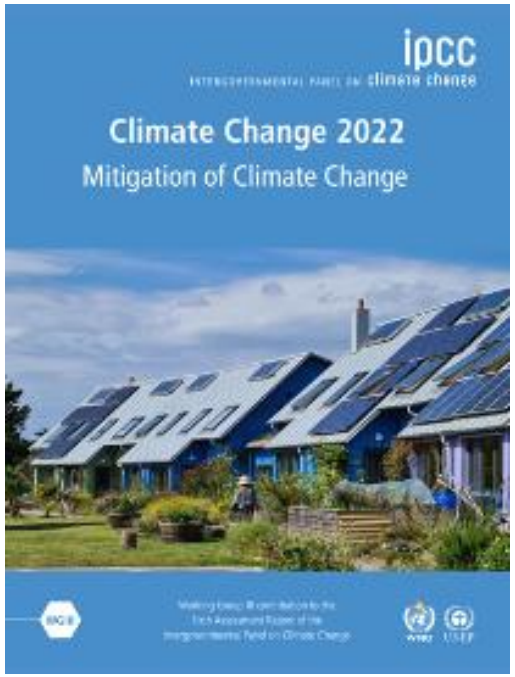
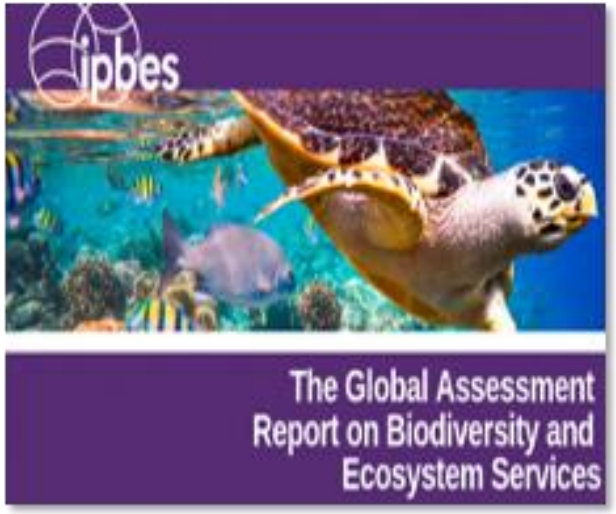
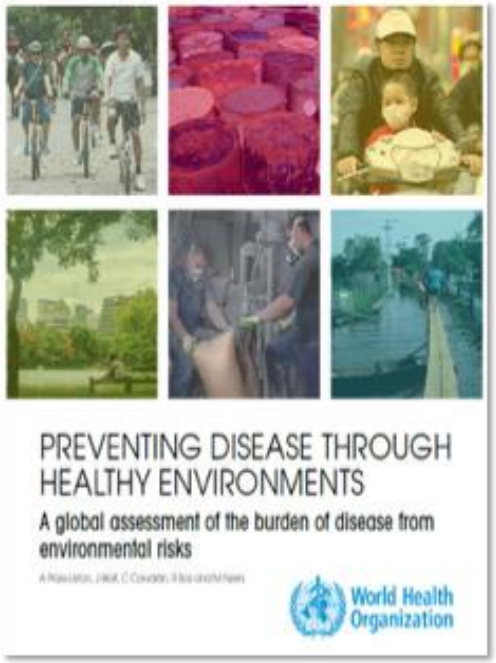
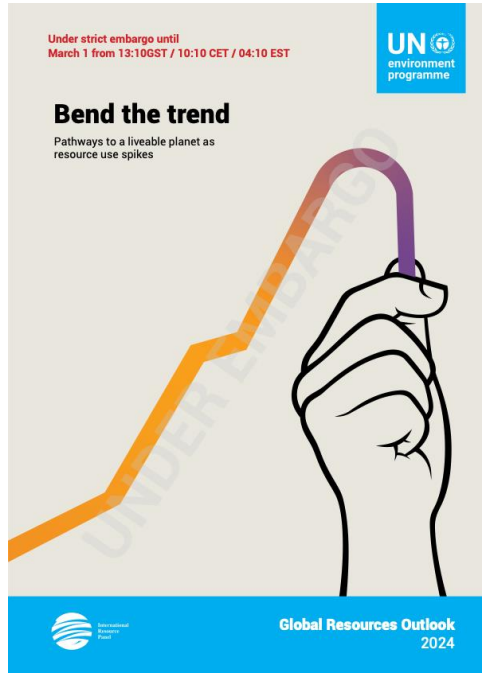
IPCC	*IPBES*	*WHO*	*IRP*
Climate Change	*Biodiversity loss and Ecosystem Services*	*Environment and Health*	*Unsustainable Resource Use*

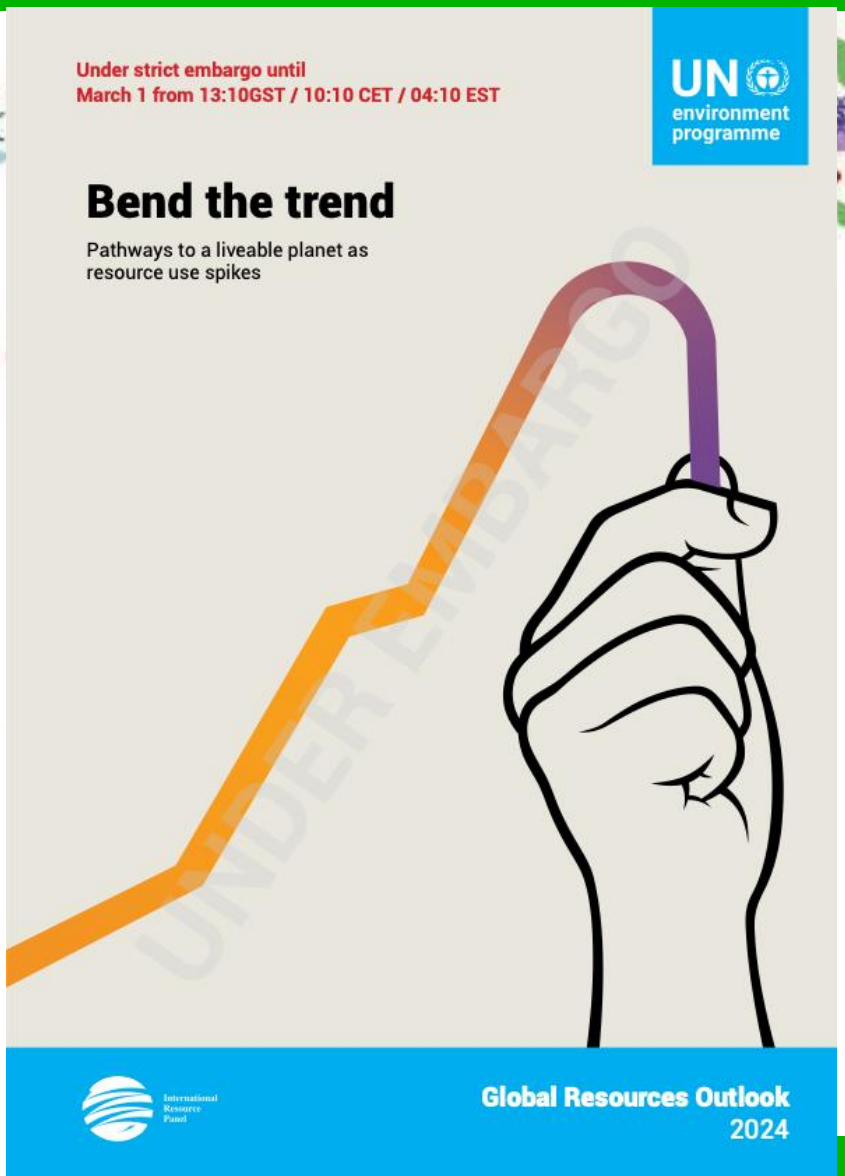








Global Resources Outlook 2024



Economy championed by industrialised nations is wasteful and unjust.

We must shift away from the prevailing resource wasteful economic approach based on maximising the output of sectors, simplistically defined by GDP, towards an economy that is efficiently meeting human needs and optimise human wellbeing. The current logic is both ethically and ecologically unsustainable.

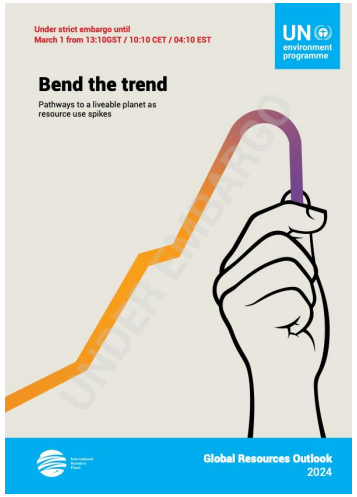
Major novelty of GRO24

- *We were simply setting the order right. Economy was invented to serve humans and not the opposite.*
- *We were looking at how to optimise provisioning systems, human needs, rather than maximising the output of individual sectors. We acknowledge the usefulness of GDP, but we should be guided by wellbeing.*
- *We propose to focus on most resource intensive provisioning systems - built environment, mobility, food, and energy, which represent 90% of global material demand.*

CHAPTER 2

Drivers, pressures, and natural resource use trends

Definition: Materials and Resources



***Biomass**: crops for food, energy and bio- based materials, wood for energy and industrial uses*

***Fossil fuels**: covering coal, gas and oil, among other*

***Metals**: such as iron, aluminum and cooper, among other*

***Non-metallic minerals:** sand, gravel, limestone and minerals used for industrial applications*

Land

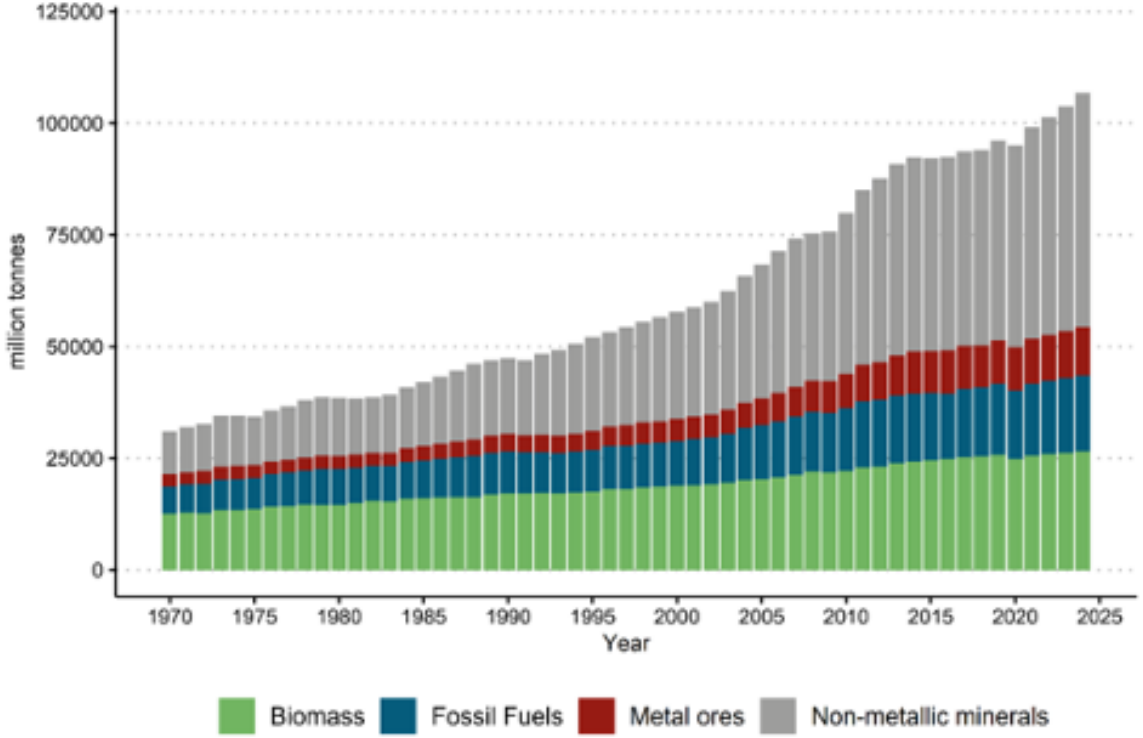
Water

Materials:
Everything extracted from the Earth

Resources:
Materials + Land and Water

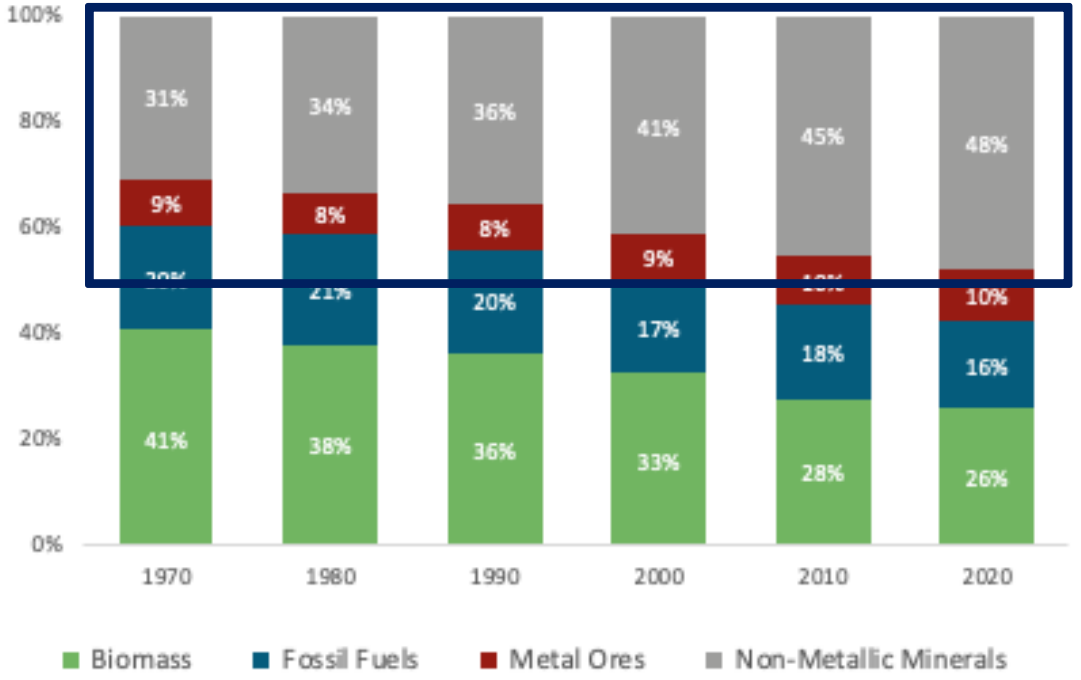
Trends: Global Material Use and Share in 1970-2023

Global Material Use has increased for more than a factor of 3 since 1970 due to urbanisation and industrialisation (and population growth) - 2.3% per year



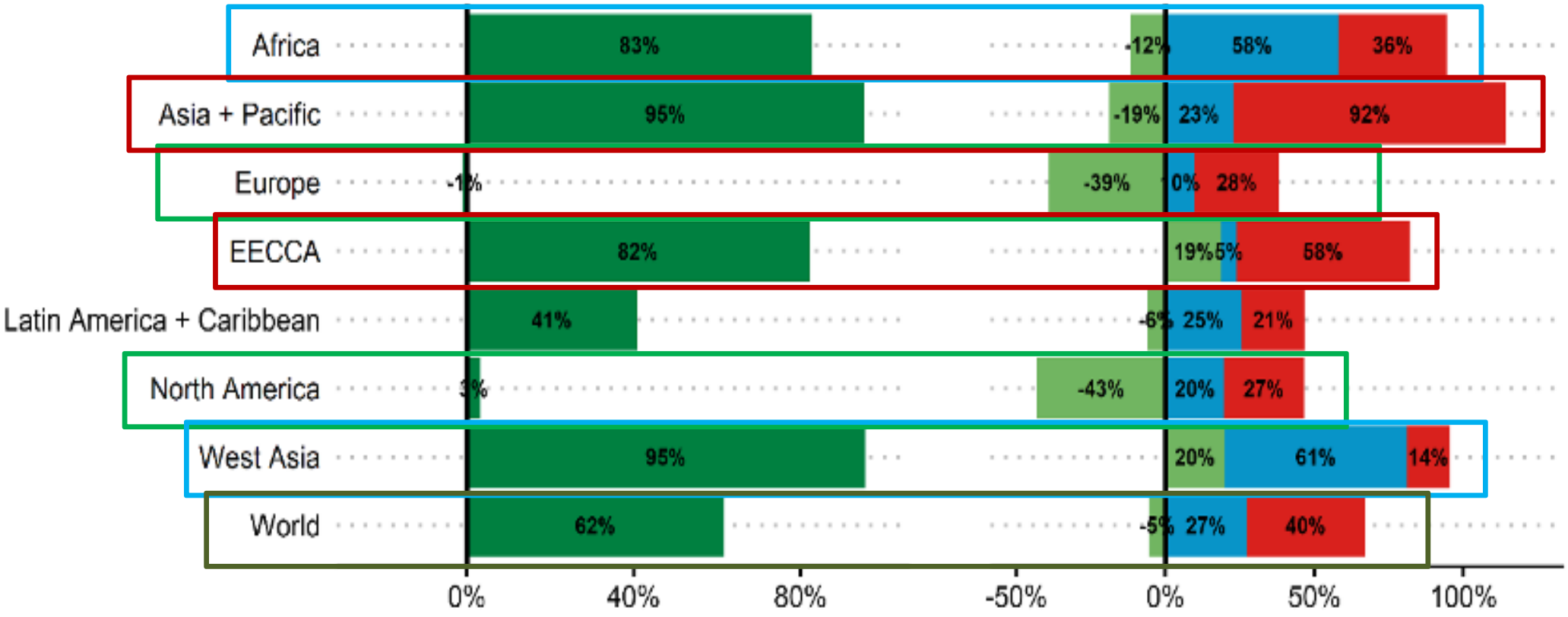
Global material extraction, four main material categories, 1970 – 2024, million tones.

… which is increasing also the share of Non-Metallic Minerals in Global Material Use



Global material extraction, four main material categories, 1970-2020, shares

Trends: Drivers of Material Footprint 2000-2022, % by world regions



Tons per capita - 2020
5
13
17
18
12
30
13
13

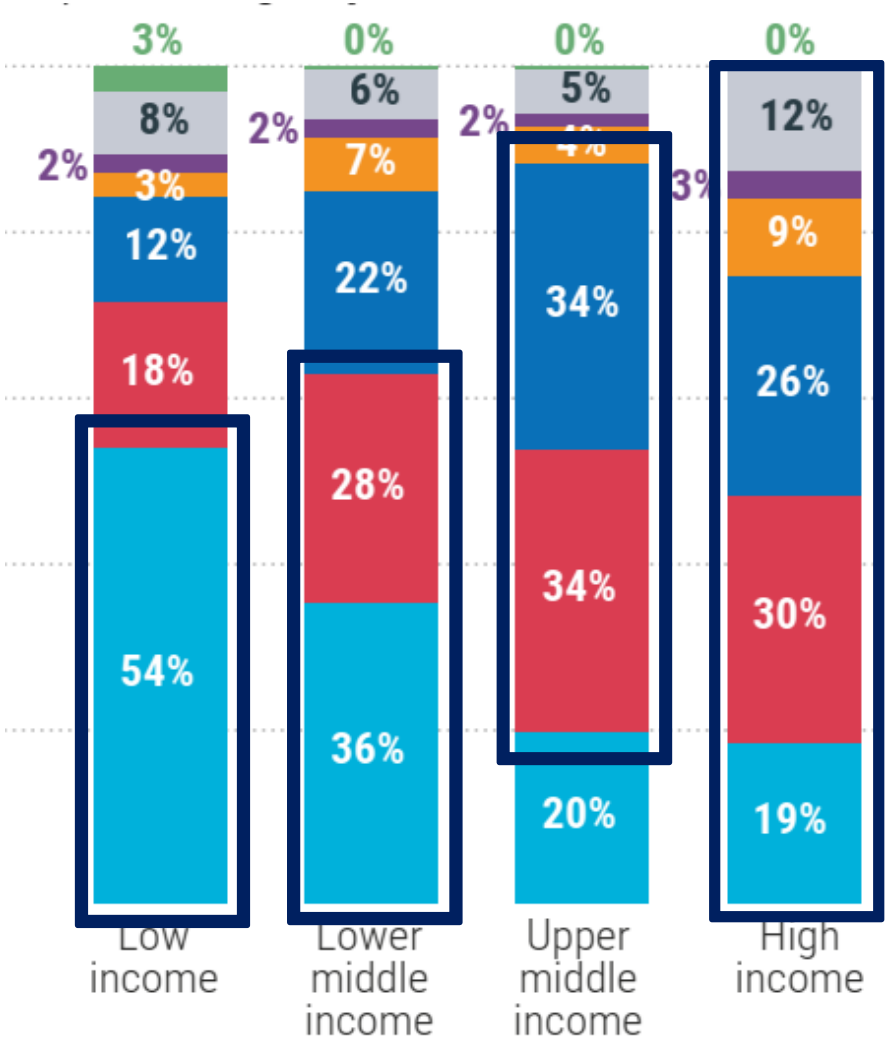
Net change % DE Material Footprint

Affluence

Population

Technology

Trends: The material needs for provisioning systems (built environment, mobility, energy and food) by country income groups (2020)



Food
Mobility
Built environment
Energy
Communication
Other
Waste Management and Resource Recovery

Energy includes household energy consumption
All other provisioning systems include their embodied energy

Built environment and mobility: *(construction, transport sector&infrastructure): 59 billion tonnes*

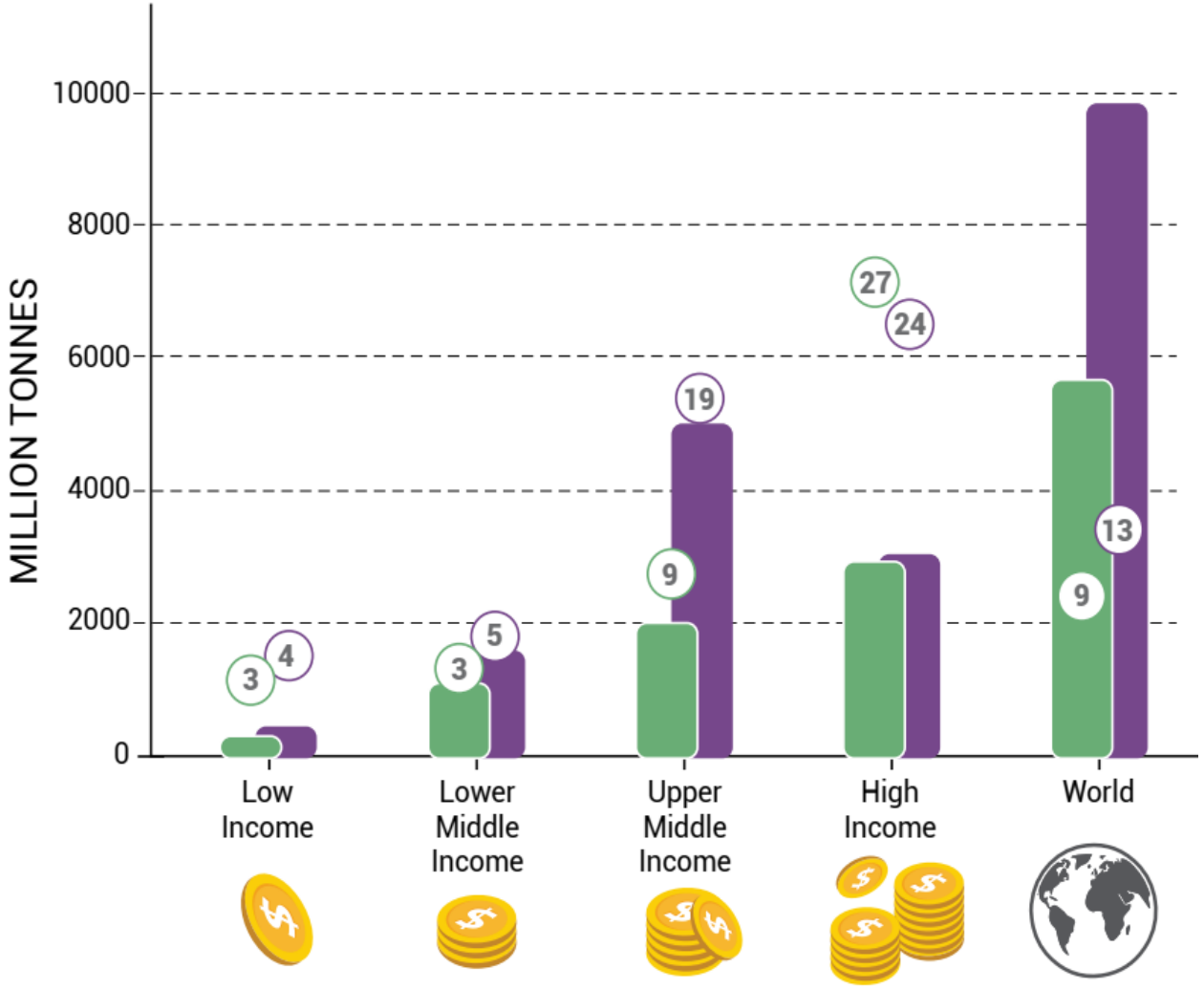
Food*: 23.6 billion tonnes*

Energy: *(electricity, power, heat): 6.1 billion tonnes*

Together = 90% of total global material demand, but differ in importance by income group

Source: Global Material Flows Database (UNEP 2023a)

Trends: High-income countries use six times more materials per capita and are responsible for ten times more climate impacts per capita than low-income countries.

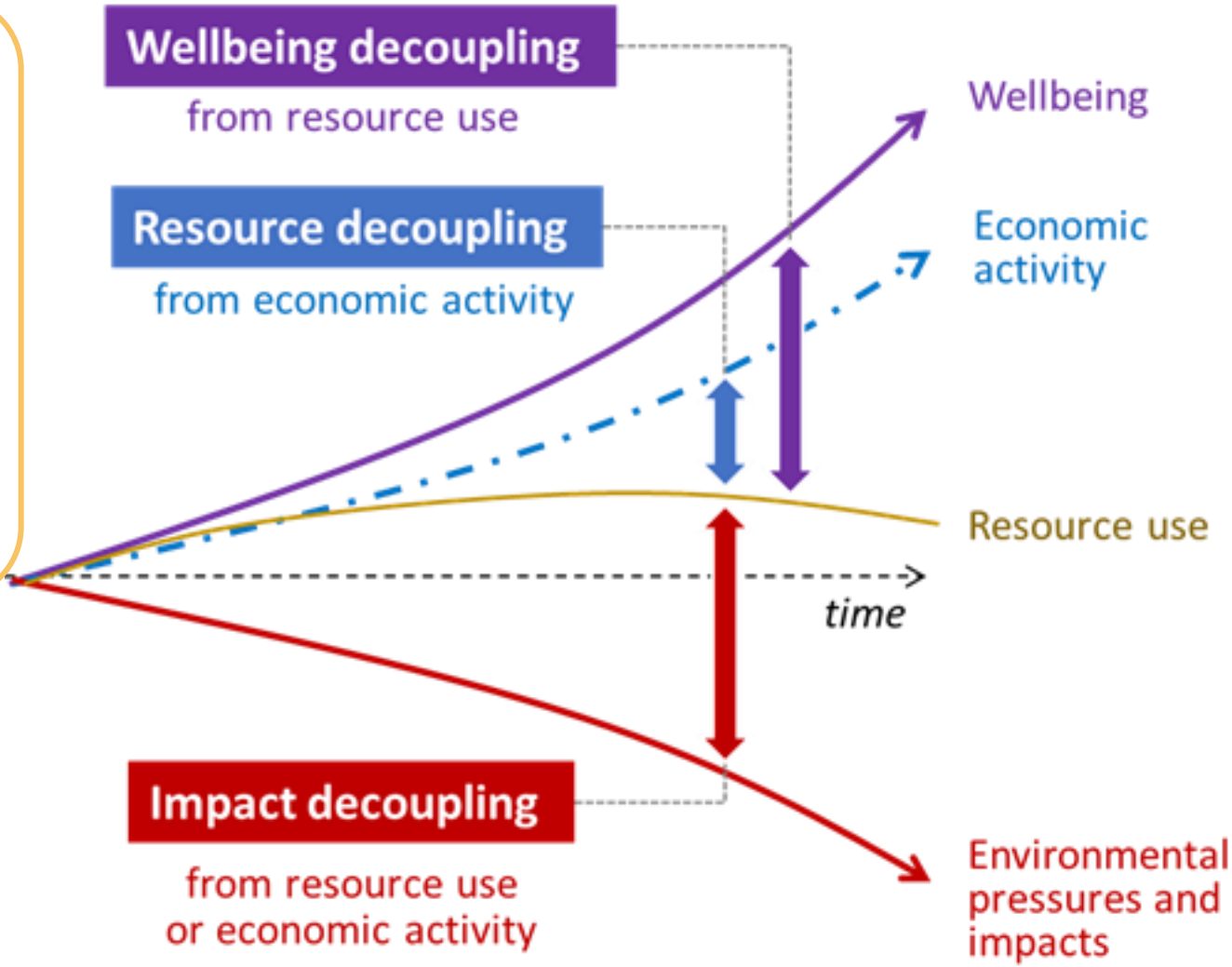


Since 2000 …

- *High-income: Highest material footprint of all groups, relatively constant. Climate impact per capita = 10 x low-income group.*
- *Middle-income: material footprint more than doubled, approaching high-income levels. Climate impact per capita = roughly 50% of high-income group; 6 x low-income group.*
- *Low-income: Remain comparatively low, and mostly unchanged.*

If current trends would continue, global material consumption is predicted to increase for 60% by 2060 comparing to 2020 levels

Decoupling



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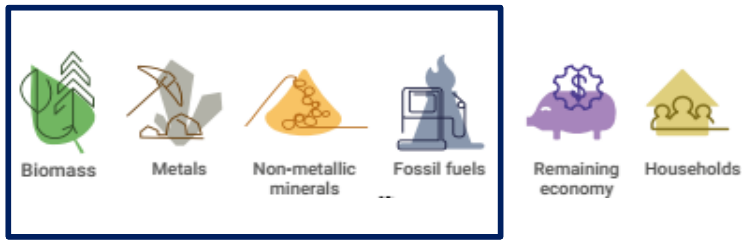
CHAPTER 3

Resource use is driving the triple planetary crisis

Impacts: Extraction and Processing of Natural Resources Drives all Aspects of the Triple Planetary Crisis

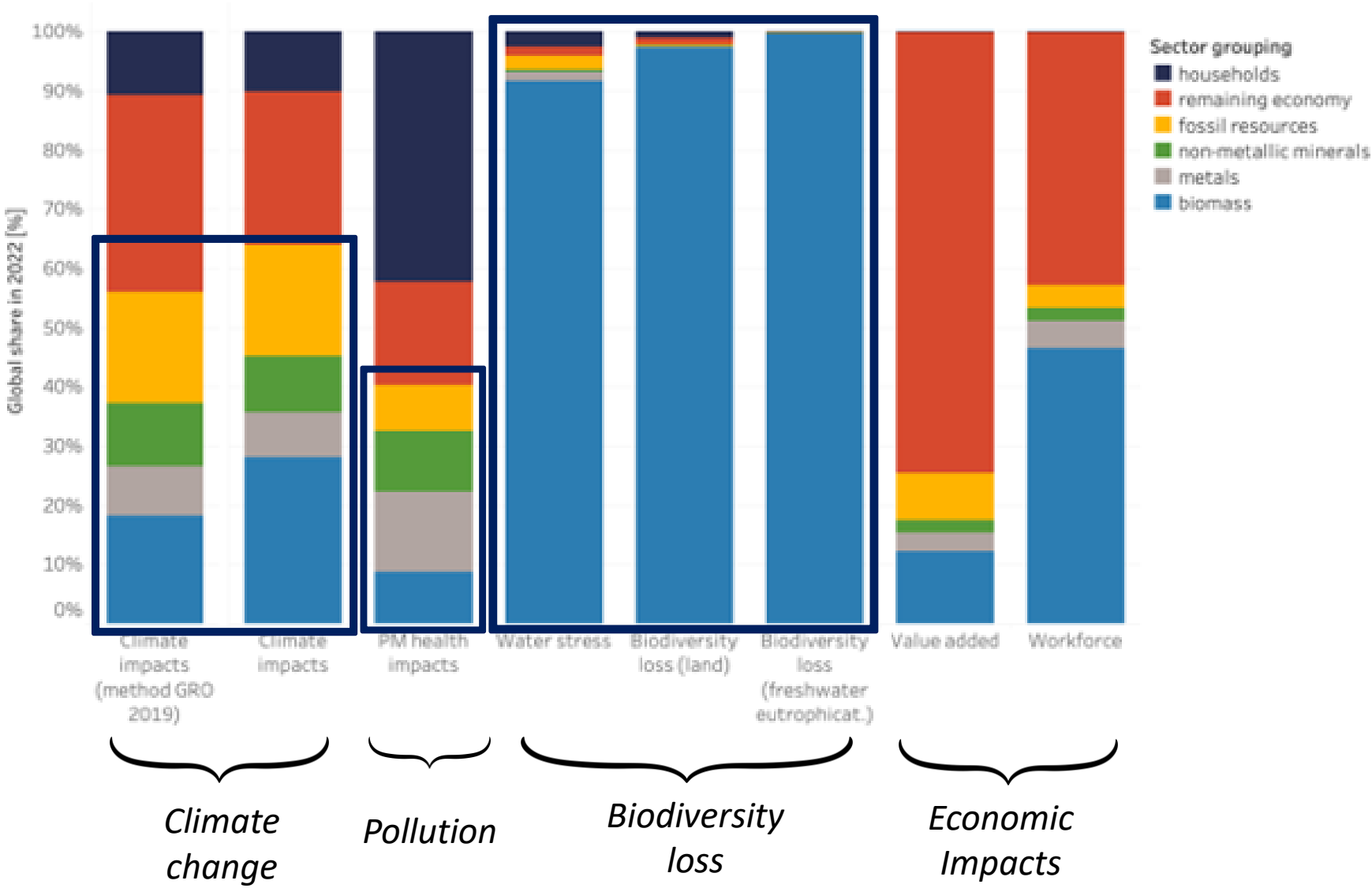
Environmental impacts of materials in the value chain in extraction and processing phase

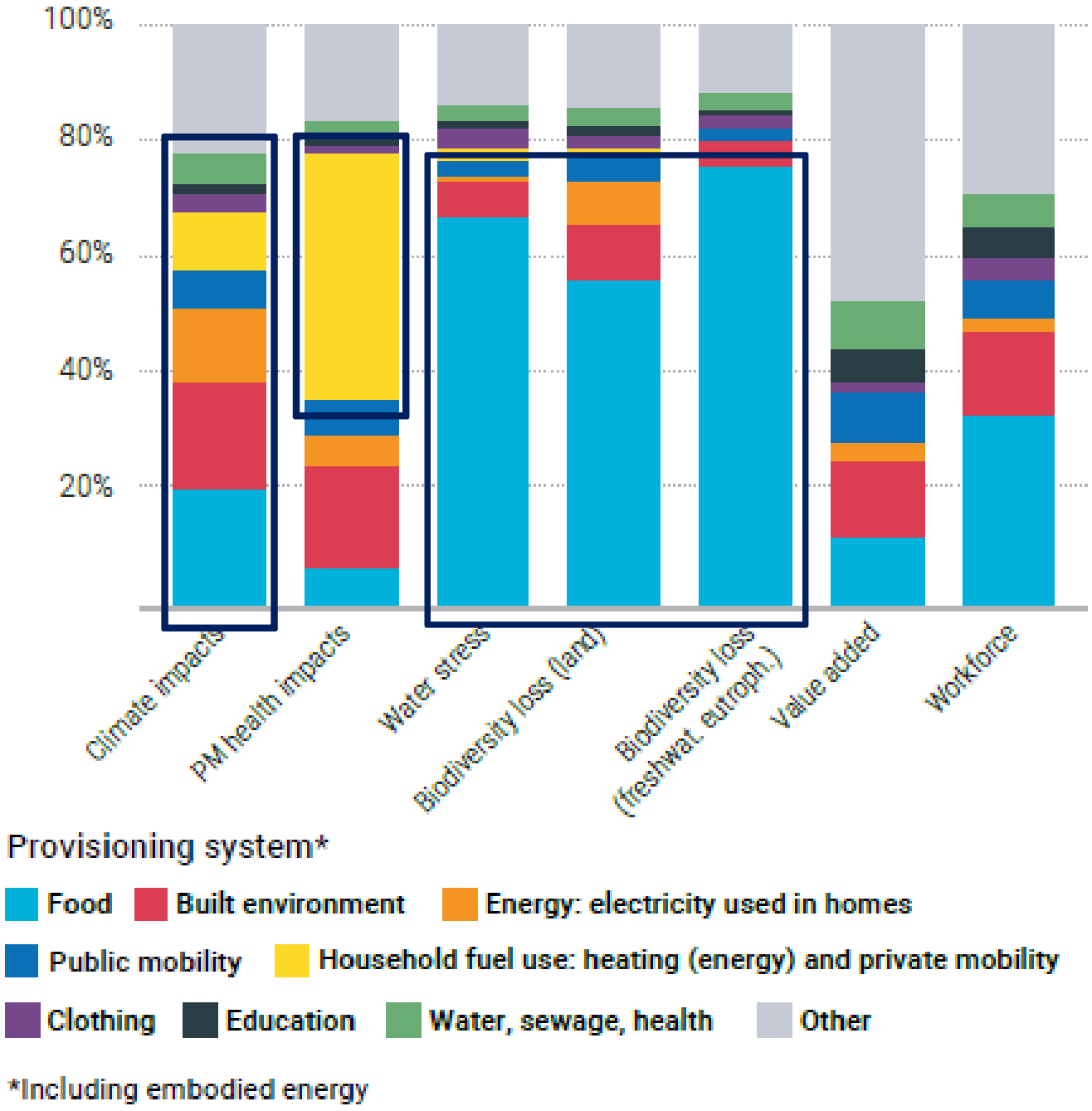


60% of global climate change impacts including land use change

40% of air pollution health impacts

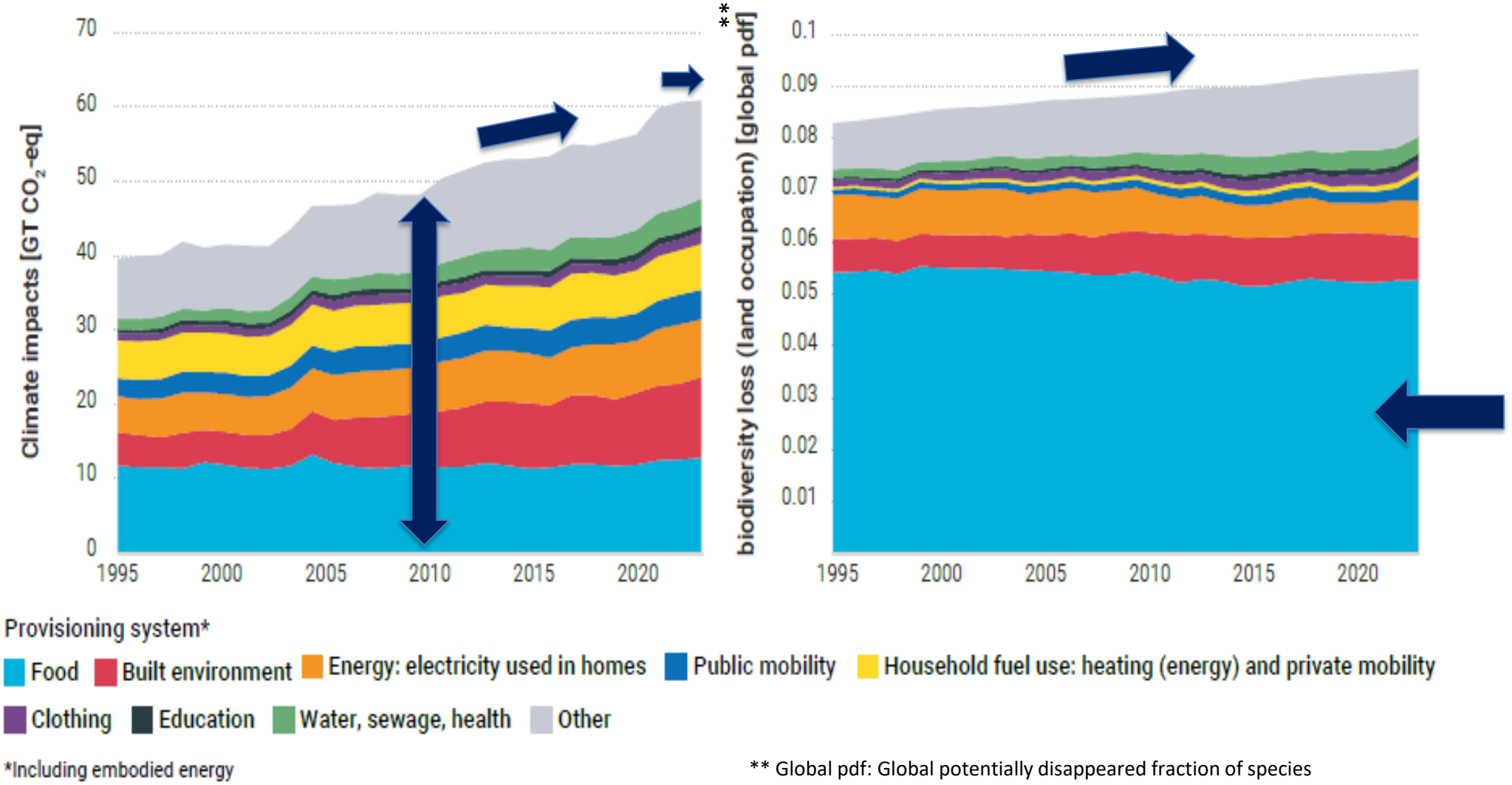
More than 90% of water stress and global land and water eutrophication related biodiversity loss





Impacts: "Provisioning Systems Human Needs in the Year 2022

Impacts: "Provisioning systems" - human needs with most environmental impacts requesting our focus



** Global pdf: Global potentially disappeared fraction of species

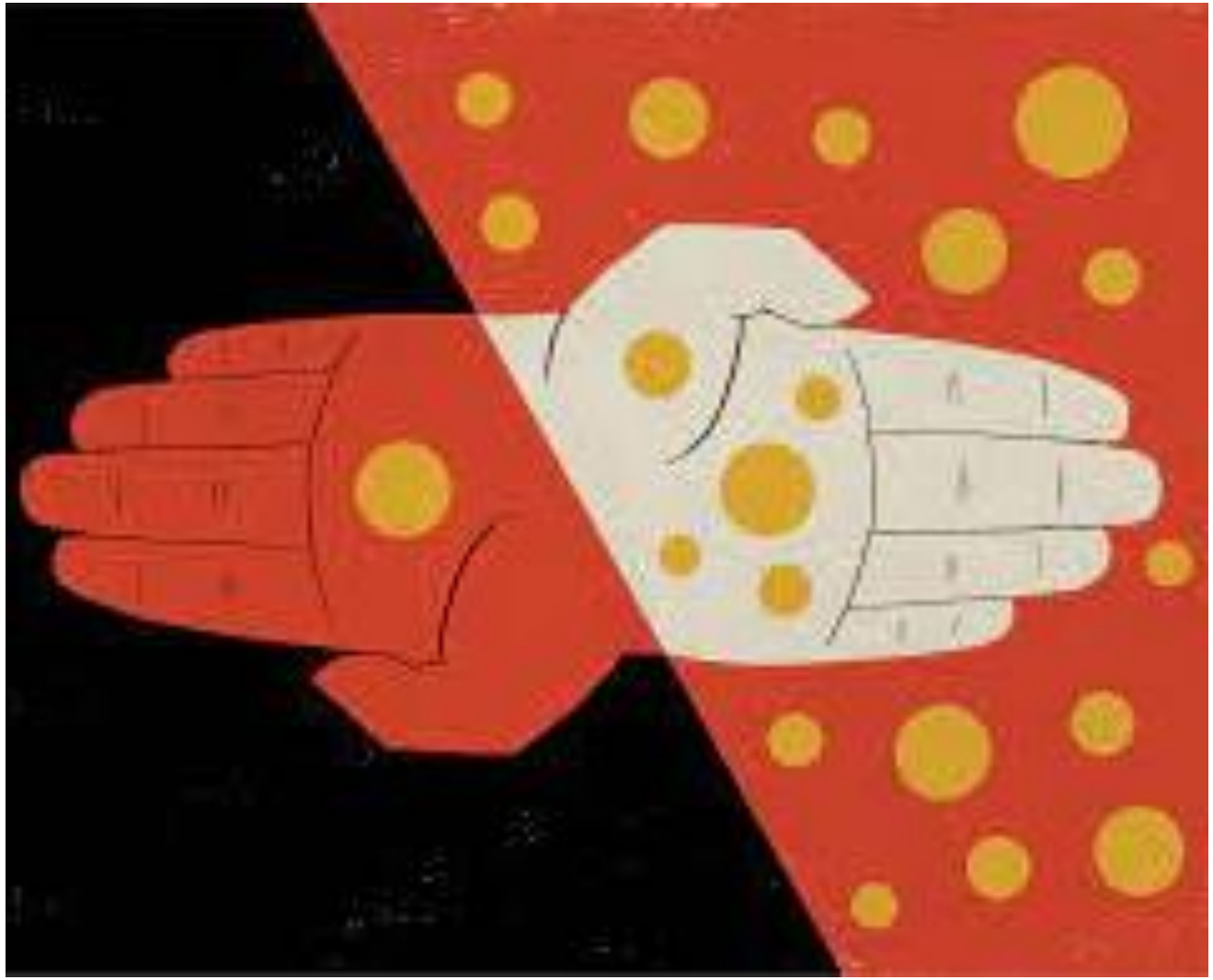
CHAPTER 3

Resource use and equity & justice implications
Complementing supply with demand side

Bruce M. Boghosian: Is Inequality Inevitable?

SCIENTIFIC AMERICAN, November 1st, 2023

- *"In fact, these mathematical models demonstrate that (in market economies) far from wealth trickling down to the poor, the natural inclination of wealth is to flow upward, so that the "natural" wealth distribution in a free-market economy is one of complete oligarchy. It is only redistribution that sets limits on inequality."*

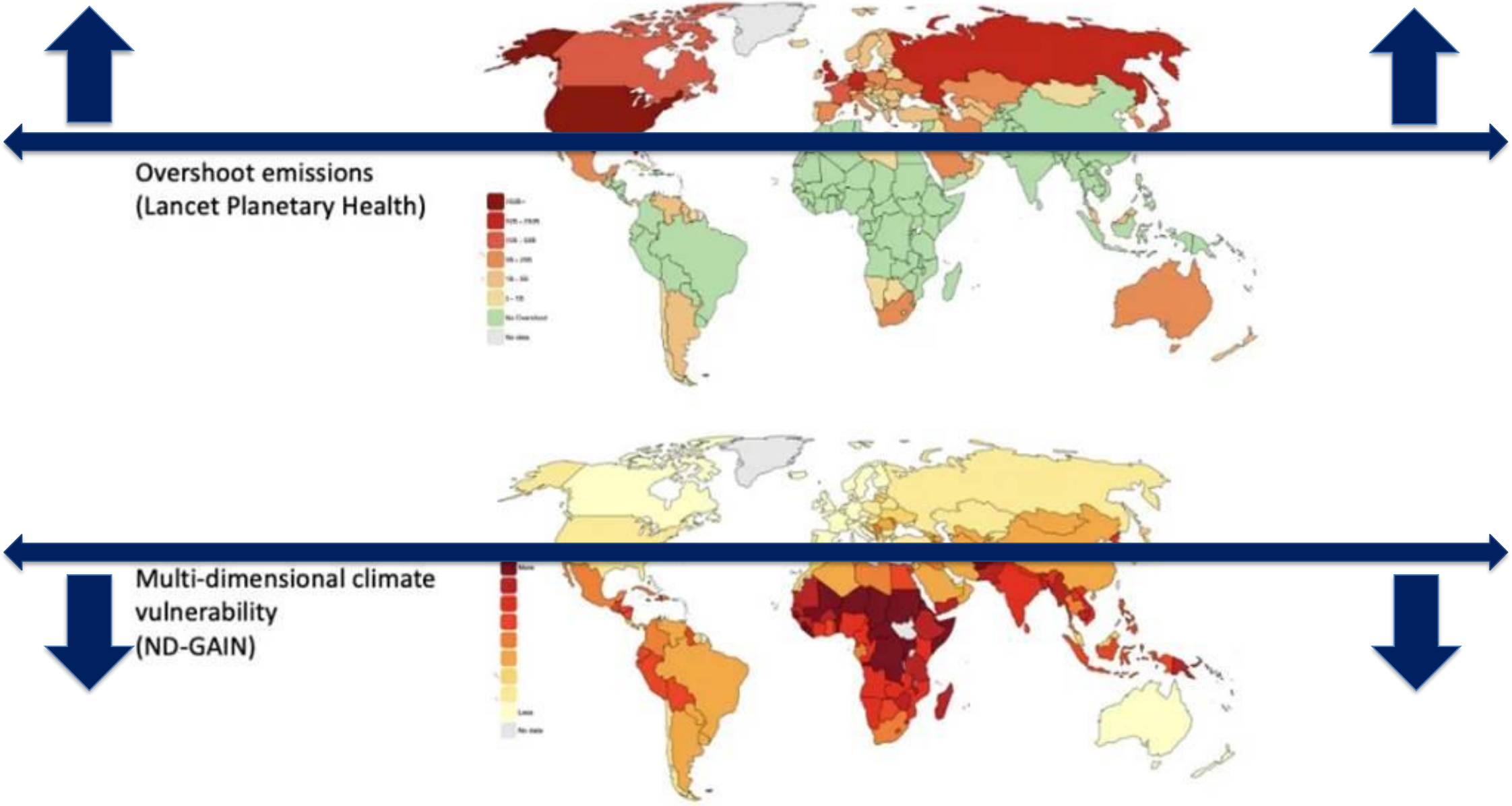


Two *scenarios:*

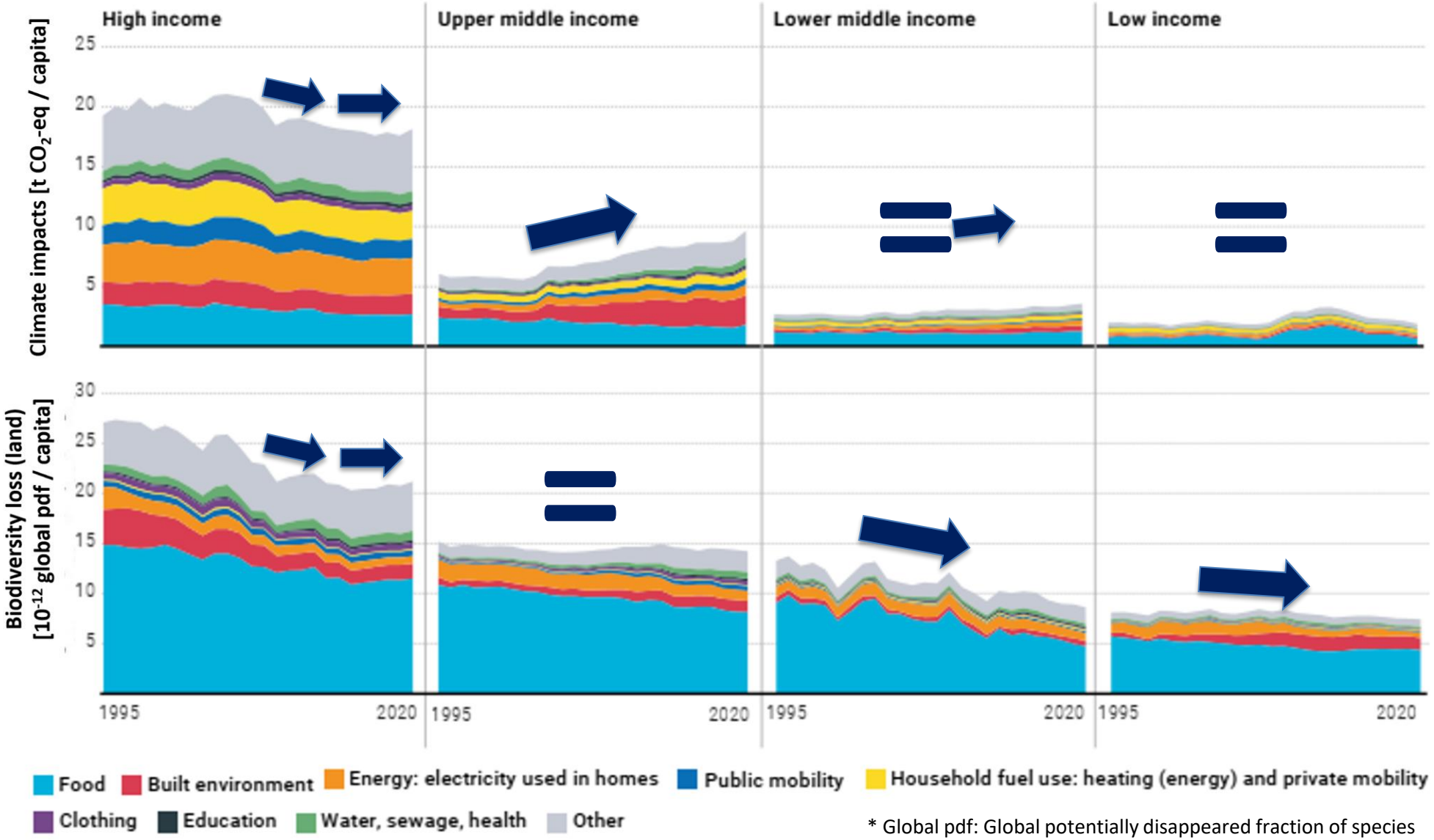
Too Little, Too Late*: continue our current destructive path and* ***The Giant Leap****: the fastest economic transformation in history.*

The key outcome *is that we will see negative social tipping before severe environmental tipping points and that equality and poverty alleviation is key if we want people to be concerned about regenerative economics and decarbonisation.*

Those Benefiting Most, and Those Facing Worst Climate Consequences



Impacts: "Provisioning systems" - human needs by income groups 1995-2020

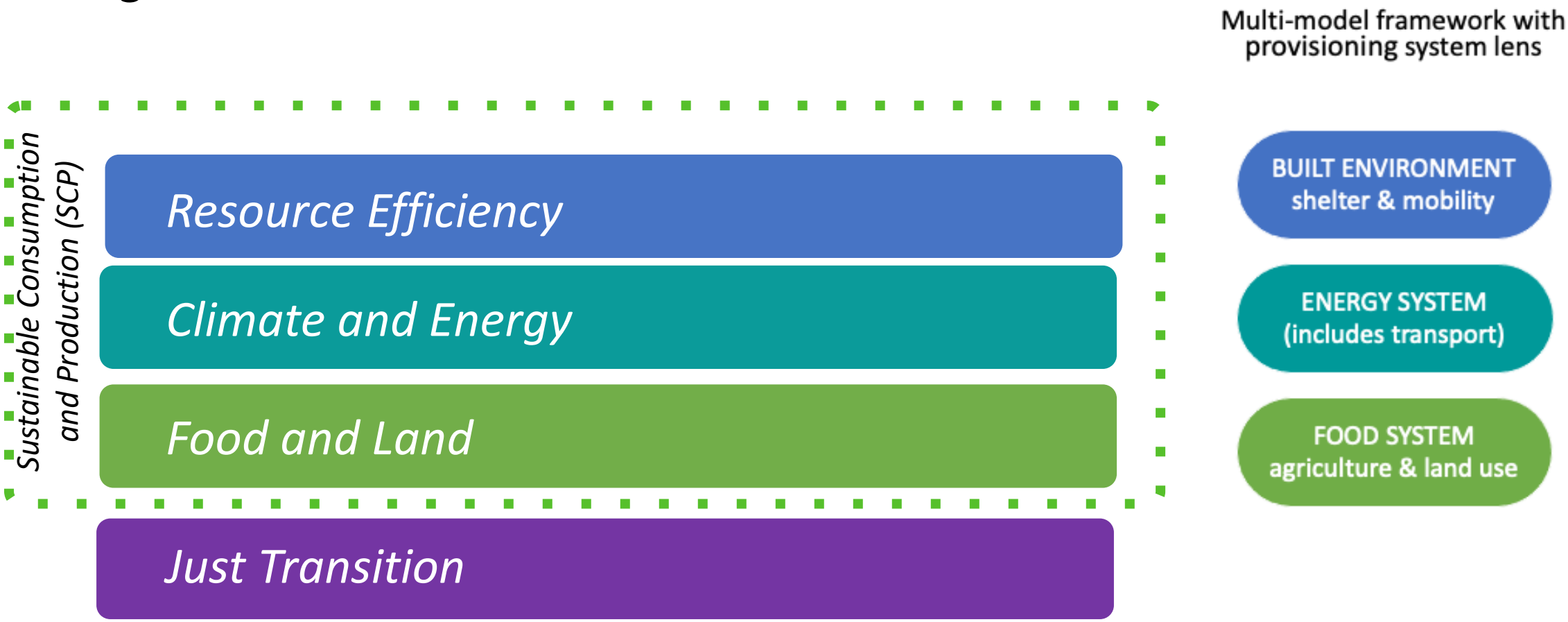


* Global pdf: Global potentially disappeared fraction of species

CHAPTER 4

Scenario Outlook

Scenario outlook: Scenario is built up as three 'shifts' plus measures to support Just Transition contrasted against Historical Trends



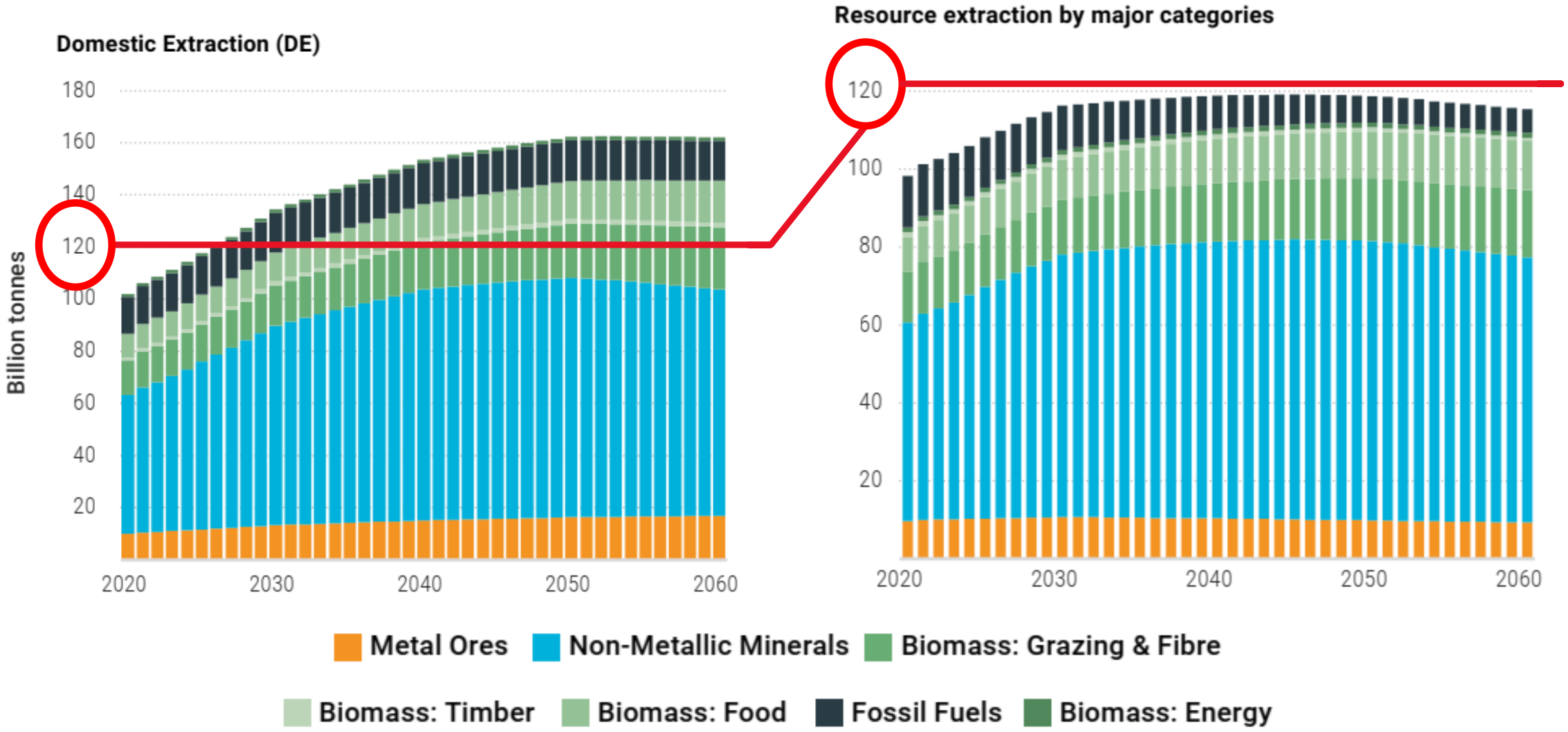
Scenario outlook: Sustainability Transition compared to Historical Trends Scenario (2060)

Growing Economy:	*+ 3%*
Reduced inequality:	*Lower income group Material Footprint gap*
Improved wellbeing:	*Higher HDI all income groups*
Reduced growth in resource use:	*By 30%*
Reduced environmental impacts:	*GHG emissions - 83%*
	Energy demand - 27%
	Agricultural land area - 5%

Impacts: Outlook of Material Extraction under two scenarios

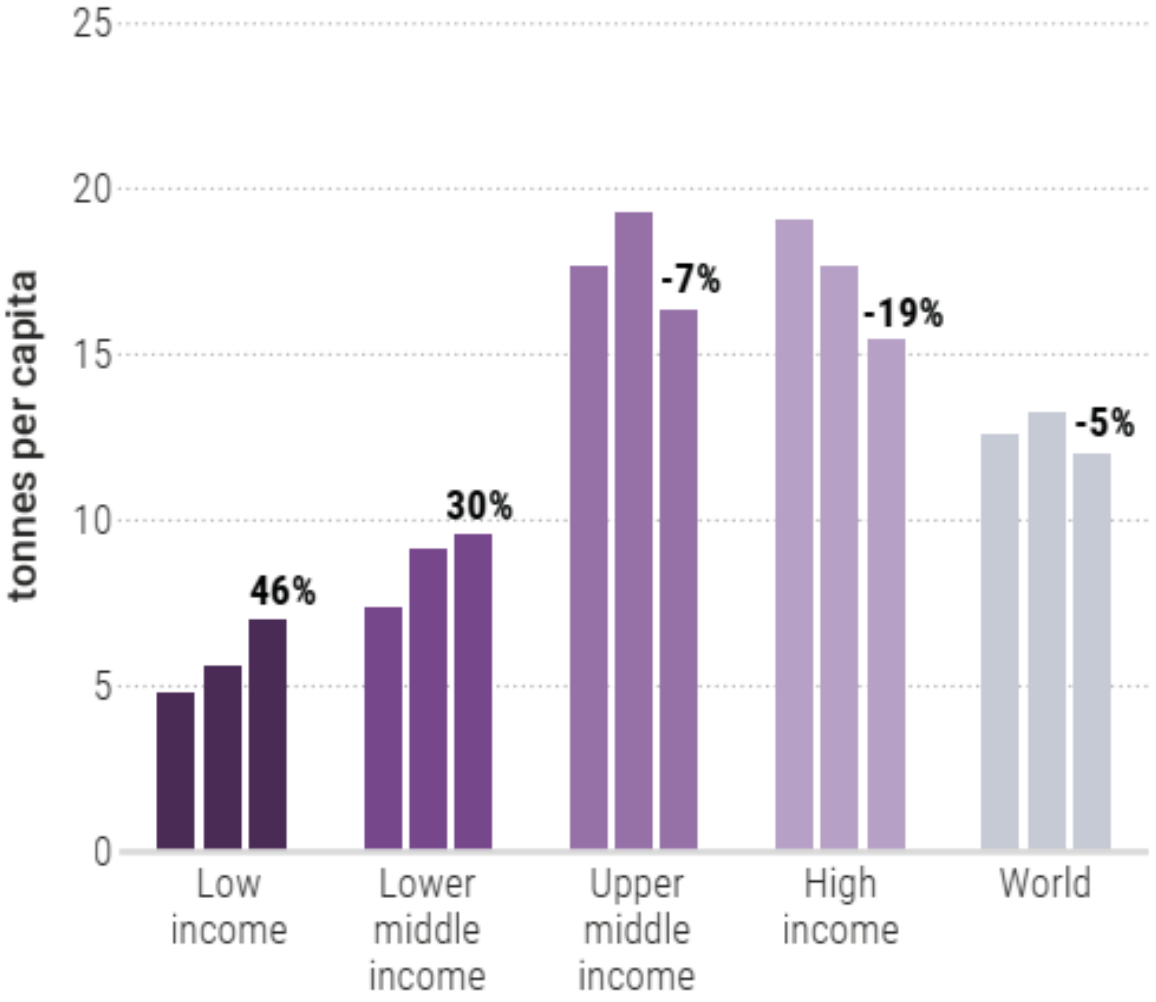
Historical Trends

Sustainability Transition

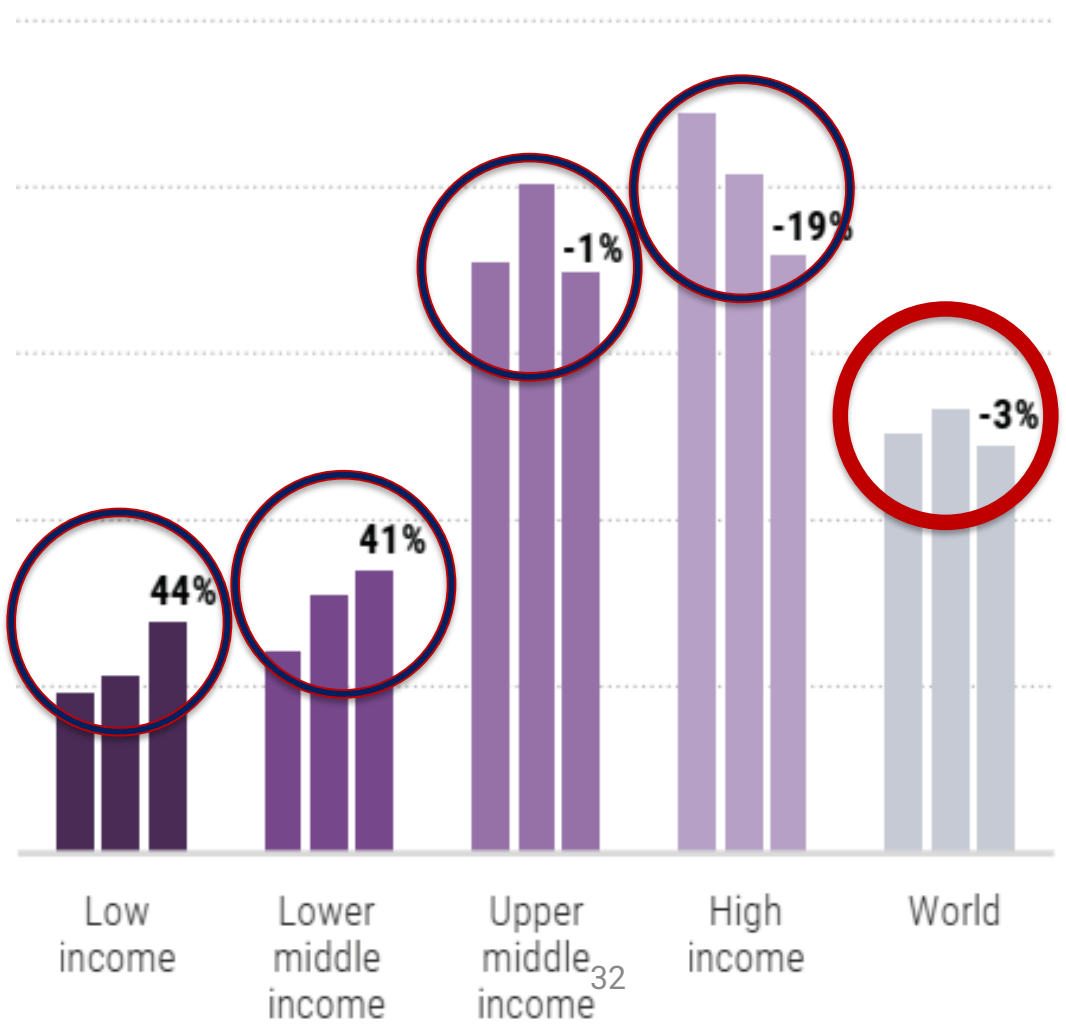


Impacts: Reductions in high consumption contexts means that resource use grows where it is most needed

Resource extraction (DE) per capita by income group, 2020, 2040 and 2060



Material footprint (MF) per capita by income group, 2020, 2040 and 2060



Source: Pixabay

A pathway towards sustainable resource use, which maintains and even enhances human wellbeing, while prevent planetary boundaries to be crossed is possible, but we urgently must change the direction and fix the broken compass

Source: Dentistry.co.uk

CHAPTER 5

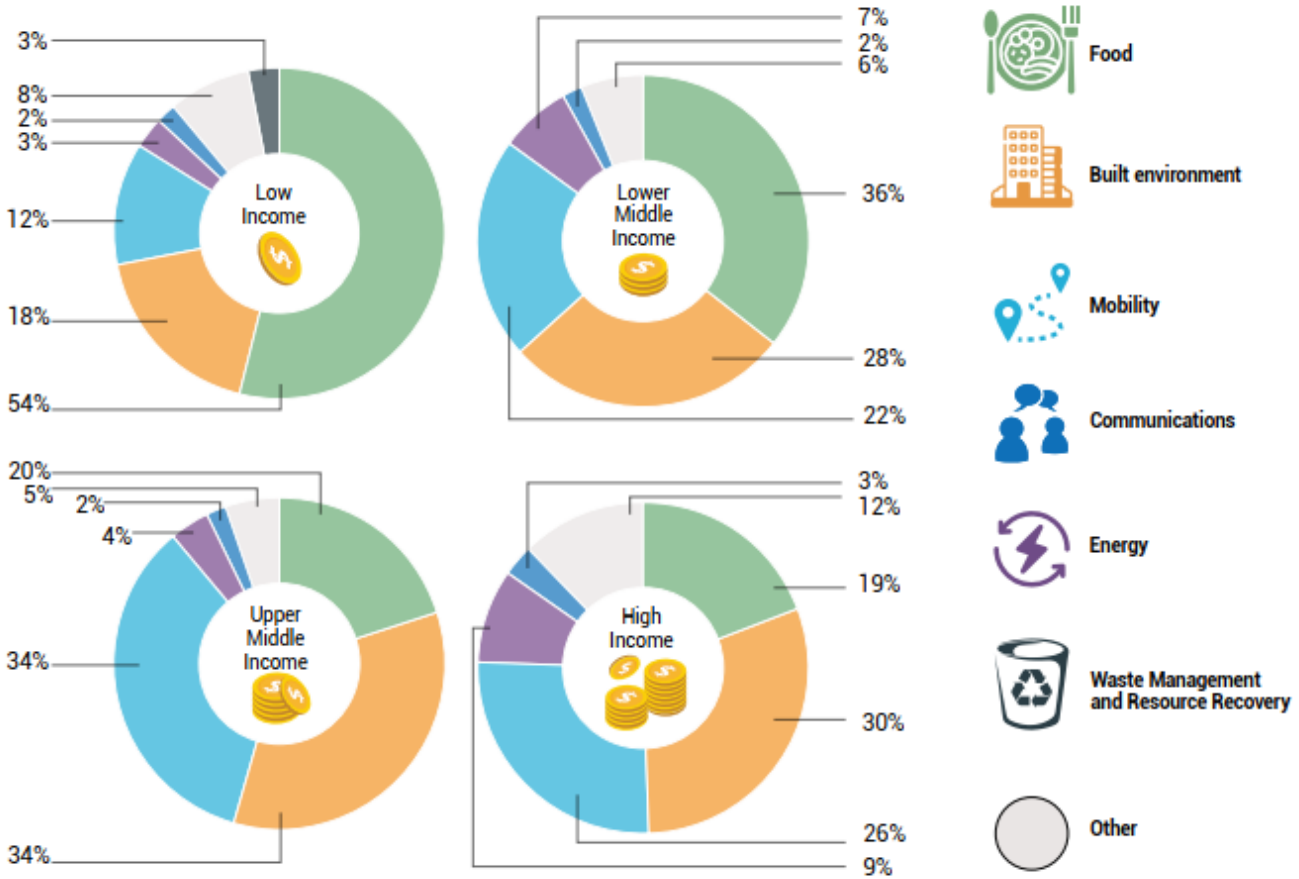
A call to action for sustainable resource use: Achieving sustainable prosperity is possible, but transformative action needs to start today

Main question often-overlooked to be addressed

How to meet human needs in most energy and resource efficient way?

https://edistaffing.com

Solutions: Focusing on supply-side (production) measures must be supplemented with a strong focus on demand-side (consumption)



Shares of material footprint by provisioning systems and by country income group, 2020, percentage

Actions should focus on the most resource-intensive provisioning systems reorganizing them by using system-based logic and solutions

This would would allow and incentivise the cross-sector innovation and shifts to a more future-fit business models leading to the reduction of resource use and deliver multiple co-benefits for people and planet.

Solutions: Main Recommendations for implementing the Just Sustainability Transition scenario

Institutionalizing resource governance** and defining **resource use paths	***Directing finance** towards sustainable resource use*	*Making **trade** an **engine** of **sustainable resource use***	***Mainstreaming sustainable consumption** options*	***Creating circular, resource-efficient** and **low-impact solutions** and **business models***
• *Global and national institutionalization of natural resource use within global sustainability agendas and action on environmental agreements* • *Definition of global and national resource use paths*	• *Internalizing the environmental and social costs of resource extraction* • *Redirecting, repurposing and reforming public subsidies for sustainable resource* • *Channeling private finance towards sustainable resource use* • *Incorporating resource-related risk into Public and Central Bank mandates*	• *Trade governance for fairness and sustainable resource use* • *Enabling local resource value retention in producer countries*	• *Developing action plans to improve access to sustainable goods and services* • *Regulating marketing practices leading to over-consumption, and raising awareness*	• *Setting up monitoring systems to identify priorities and develop ambitious circular economy action plans* • *Developing and reinforcing regulation to boost circular economy business models* • *Building circular economy capacity and coalitions*

Solutions: Strategies for Reducing Resource Use across Provisioning Systems

Provisioning system	Food	Built environment	Mobility	Energy
Recommendations	• Reducing the demand of the most impactful food commodities • Reducing food loss and food waste • Protecting and restoring productive land while meeting demand for nutrition	• Assuring sustainability of the new building stock • Retrofitting the existing building stock • More intensive use of buildings	• Cities moving towards active mobility and public transportation • Reducing carbon-intensive frequent traveling modalities • Decreasing emissions intensity of transport modalities	• Decarbonizing electricity supply through the scaling up of low-resource renewable energies and increased energy efficiency
Outcomes from policies modelled in Scenarios	Can decrease the land needed for food by 5% compared to 2020 levels while more equitably ensuring adequate nutrition for all	Can decrease building material stocks by 25% by 2060, leading to a 30% decrease in energy demand, and 30% decrease in GHG emissions compared to current trends.	Can reduce related material stock requirements (-50%), energy demands (-50%) and GHG emissions (-60%) by 2060 compared to current trends.	Can drive a sharp decrease in energy demand, with reductions of climate impacts by more than 80 per cent.

To Conclude

Science is Clear and Change is Unavoidable

Towards the World of GRO 2024

Main Blind-Spots preventing us to move faster and deeper

Lack of Holistic System approach

Public leaders and others lack capacity or knowledge of how to translate system change visions into their concrete policies/investment structures which ends in conflicting policy logics that hinder real transformation

Lack of Drivers and Pressures Perspective

Policy attention does not focus on the roots of the problem and address the drivers and pressures. It lack focus on natural resource use and management, as well as on market signals leading consumers and producers' behaviour.

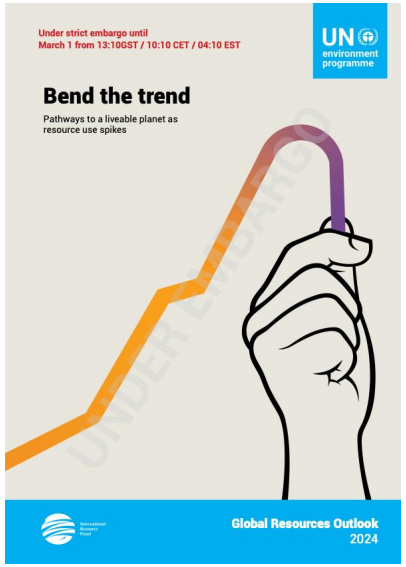
Lack of Demand Side Focus

Policy attention is mainly given to the supply side of the economy, to the cleaning of the existing economic system - lacking the attention to the demand side which is leaving out an important solutions potential and questions of responsibility and equity.

If we want to avoid extinction of elephants in nature …

we must extinct elephants in our rooms

Source: Hop distance - The elephant in the room ...blogs.bmj.com



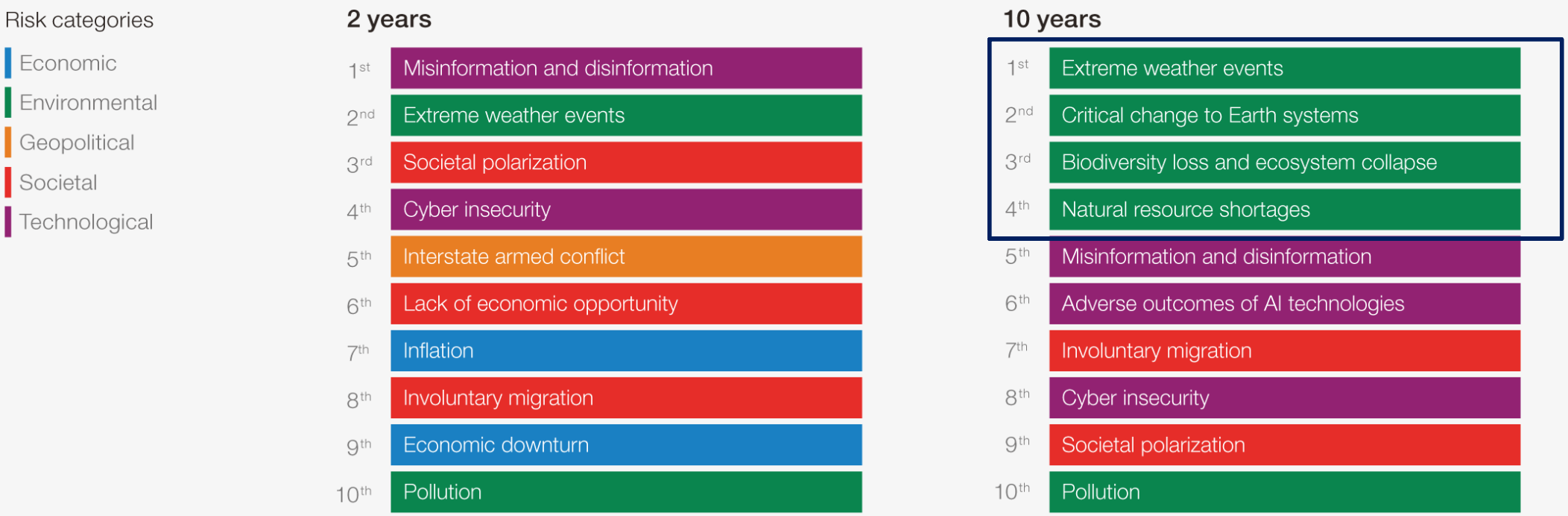
We are indebting future generations, financially and by depleting the Nature.

This is simply wrong. Apparently, we humans are the most intelligent spices on this planet. It is high time to prove it. More than an economic or a technological choice, this is a moral choice.

This System Change Transformation is also in the Interest of the Business

FIGURE C **Global risks ranked by severity over the short and long term**

"Please estimate the likely impact (severity) of the following risks over a 2-year and 10-year period."



Source

World Economic Forum Global Risks Perception Survey 2023-2024.

Any transformation is a major business opportunity

for those who are innovative, those who dare and those who understand the essence of the challenges ahead of us.

We should not accept that meeting human needs should be resource intensive and stop stimulating extraction based economic success and rather reward responsible, innovative, creative ways of meeting human needs.

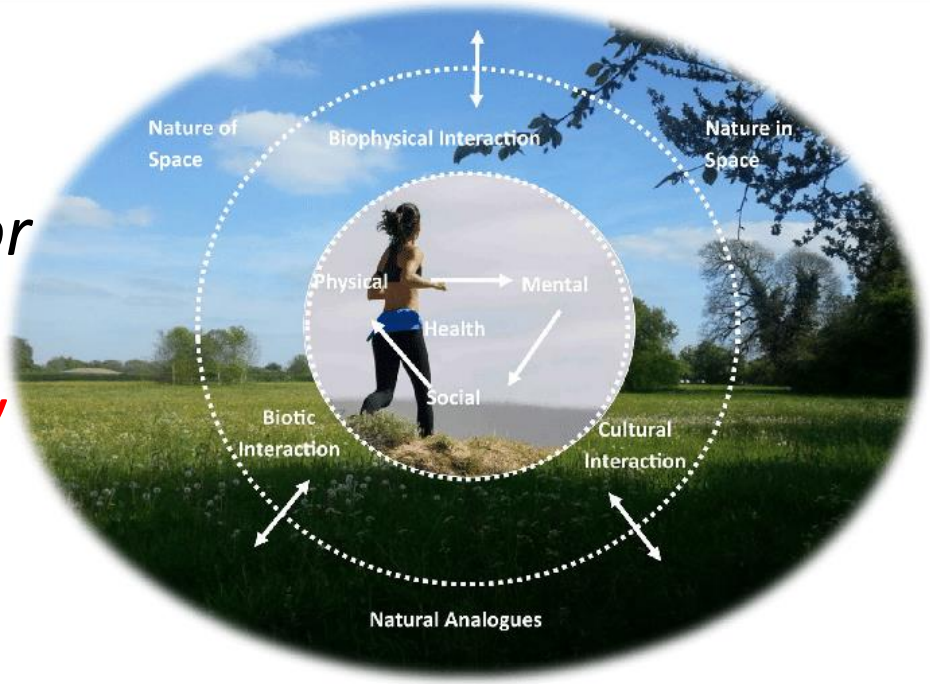
This Transformation is not only about Environmental Sustainability

Access to and use of natural resources have been in the human history closely related to the level of the achieved wellbeing, but also to stability, security, conflicts, wars (Access to Land, Water, Oil and Gas, Minerals, Precious Metals …)

And the whole history of the colonialisation of nature, is also central to fairness and equity.

Changing our Relationship with (the rest of) Nature, is ultimately an Economic, Equity and Security Imperative to strengthen collective Resilience

The lessons learned recently (war, pandemic, the hottest summer) are more than convincing to understood that. This relationship is not stable, nor balanced, and it will be resolved either with collective wisdom and effort, or in a hard and very painful way (conflicts, pandemics, migration …)



The future will be green … or there will be no future.

The world has enough for everyone's need, but not for everyone's greed"

Mahatma Gandhi

THANK YOU

for helping us delivering the future we want!