SVENSKA ARALSJÖSÄLLSKAPET

Swedish Aral Sea Society

Global Sustainability Challenges and ESD

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Implementing Education for Sustainable Development in Higher Education January 23rd 2025

Where we are today?
The Global Sustainability Situation

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The Global Sustainability Situation

Four critical areas

Climate

Biodiversity

Water

Economy

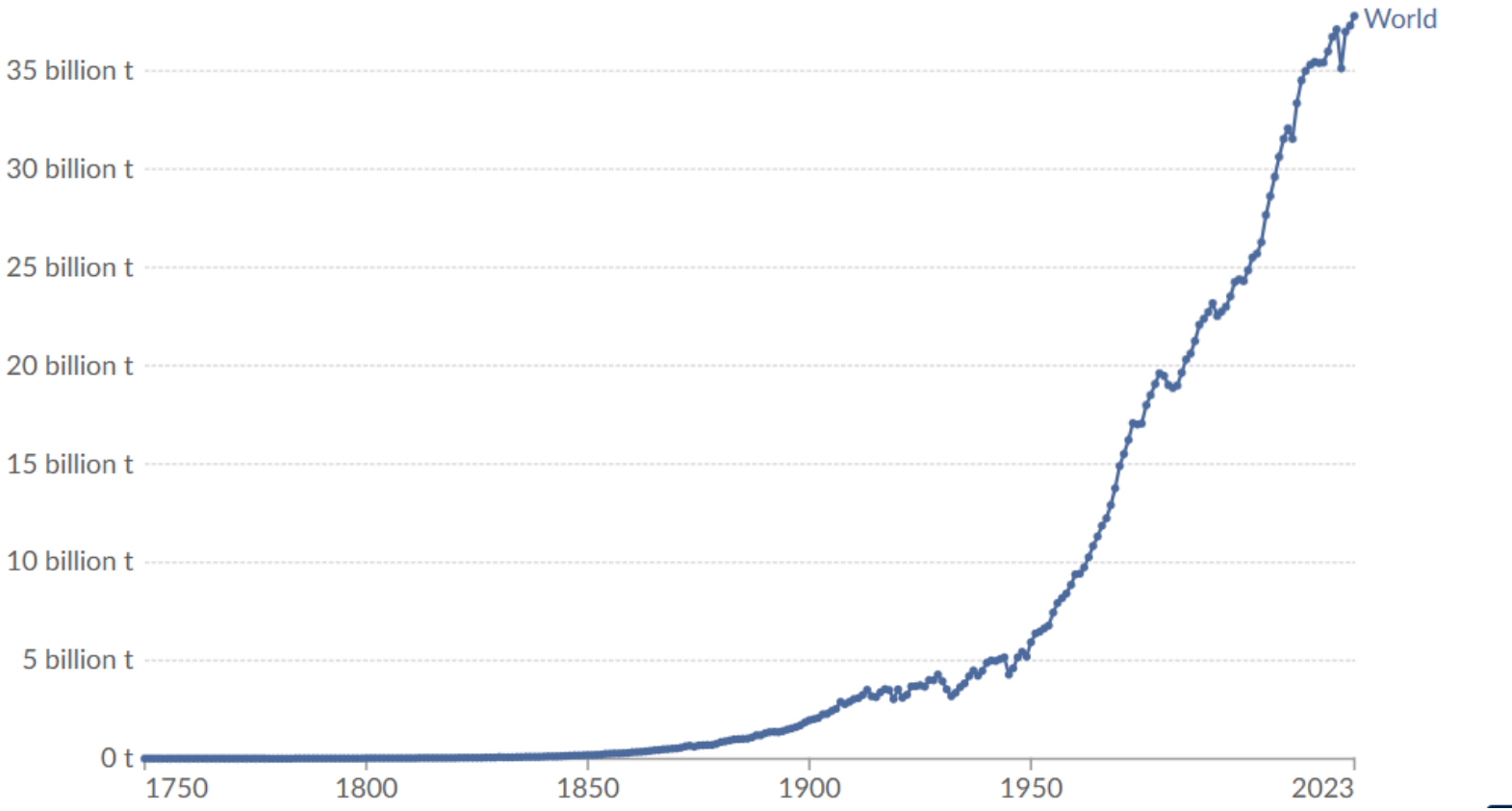
Annual CO_2 emissions

Carbon dioxide (CO_2) emissions from fossil fuels and industry. Land-use change is not included.

Our World in Data

Table | Map | Chart

Edit countries and regions | Settings



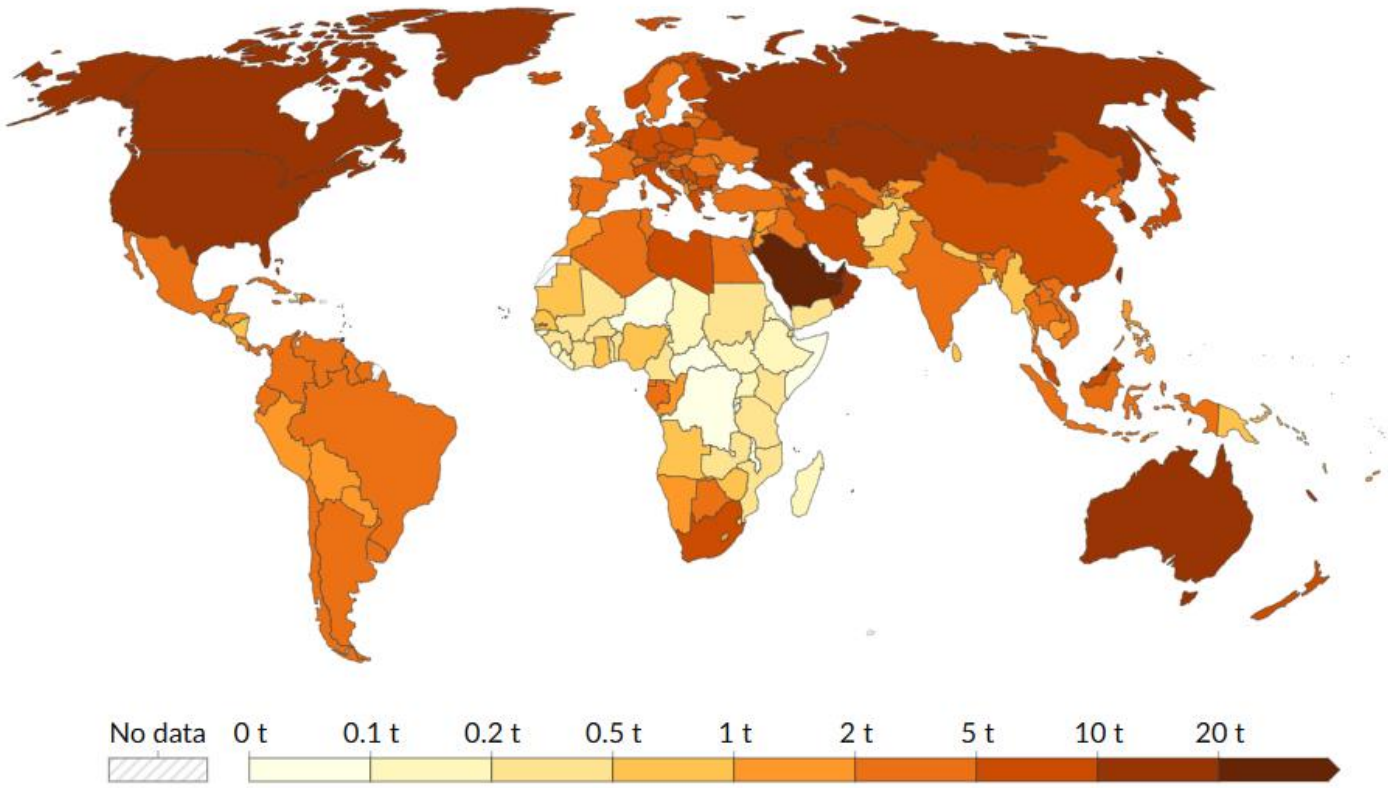
Per capita CO_2 emissions, 2023

Carbon dioxide (CO_2) emissions from fossil fuels and industry. Land-use change is not included.

Our World in Data

Table | Map | Chart

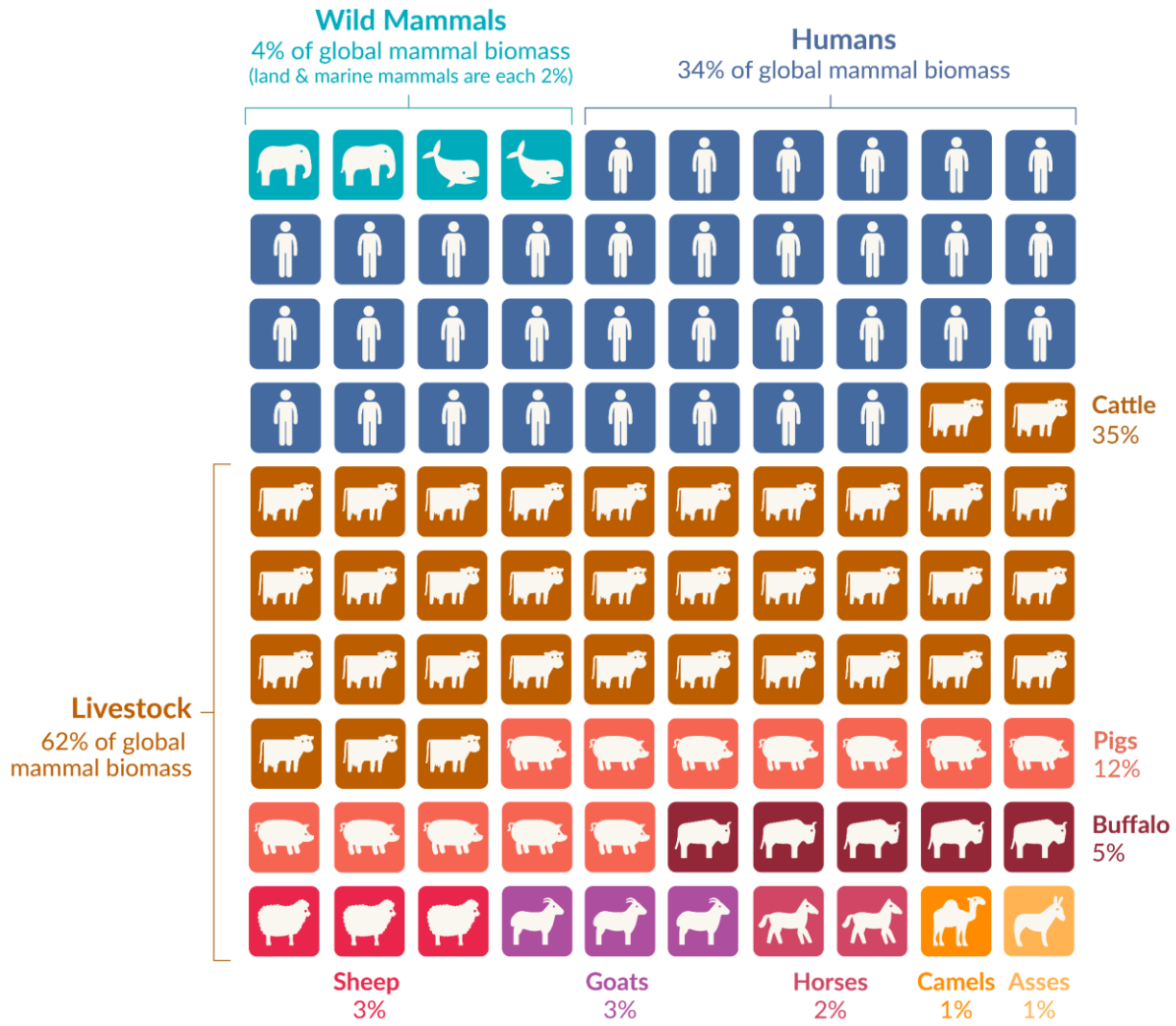
World



Distribution of mammals on Earth

Our World in Data

Mammal biomass is measured in tonnes of carbon, and is shown for the year 2015. Each square corresponds to 1% of global mammal biomass.



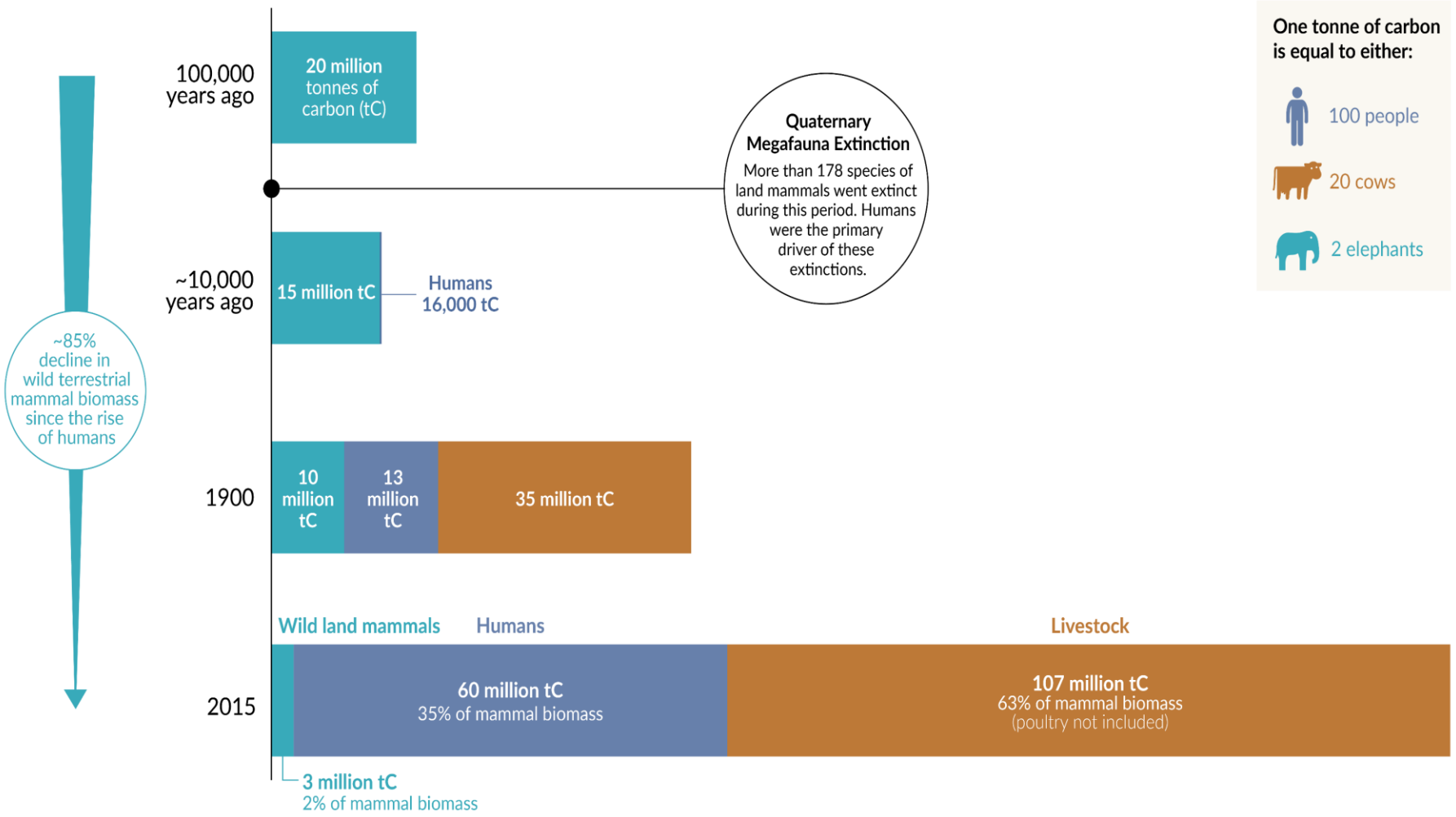
Note: An estimate for pets has been included in the total biomass figures, but is not shown on the visualization because it makes up less than 1% of the total.

Humans account for around one-third of mammal biomass. Almost ten times greater than wild mammals. Our livestock then accounts for almost two-thirds. Wild animals is about 4 %.

Changing distribution of the world's land mammals

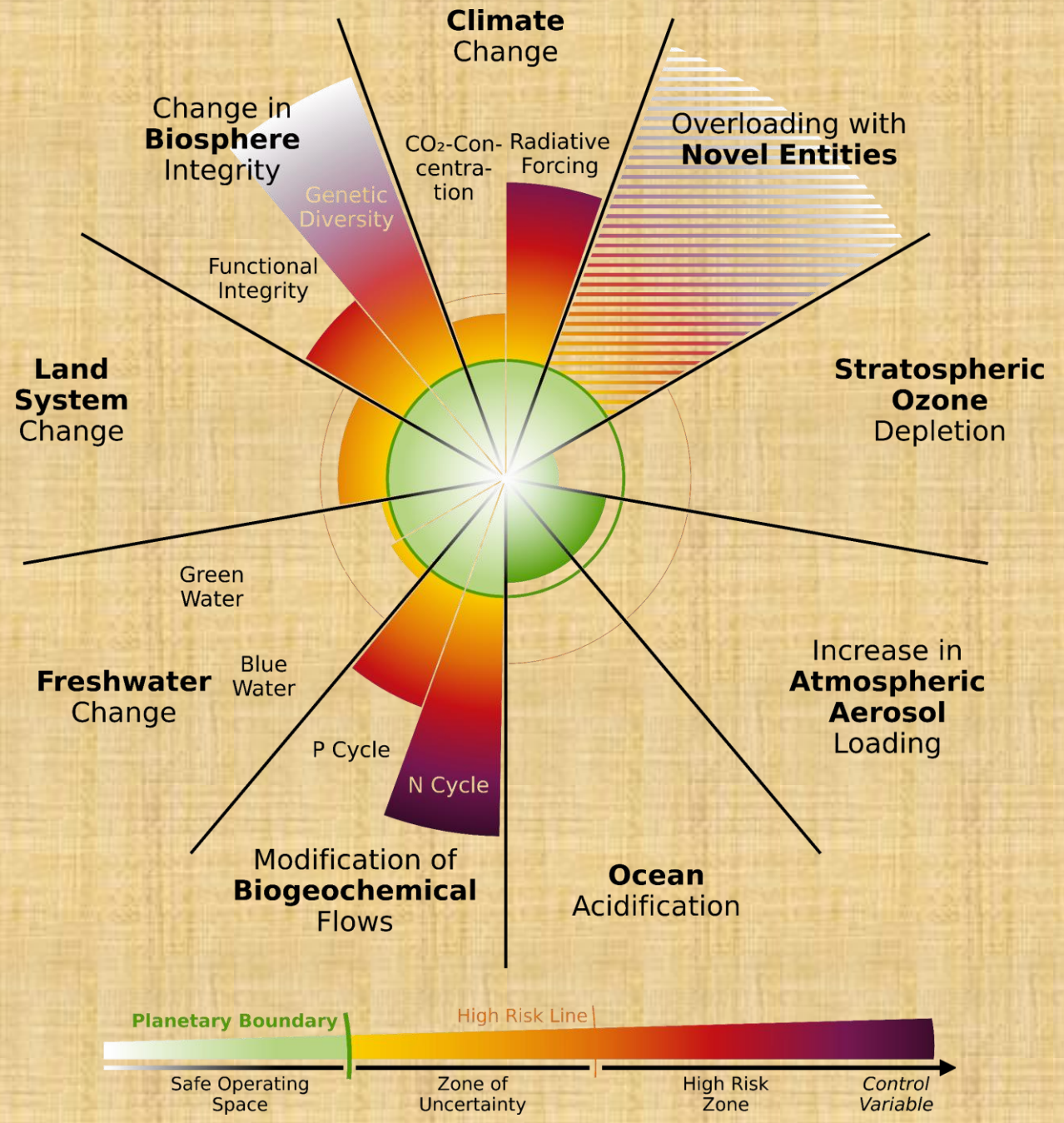
Mammals are compared in terms of biomass, measured in tonnes of carbon.

Our World in Data

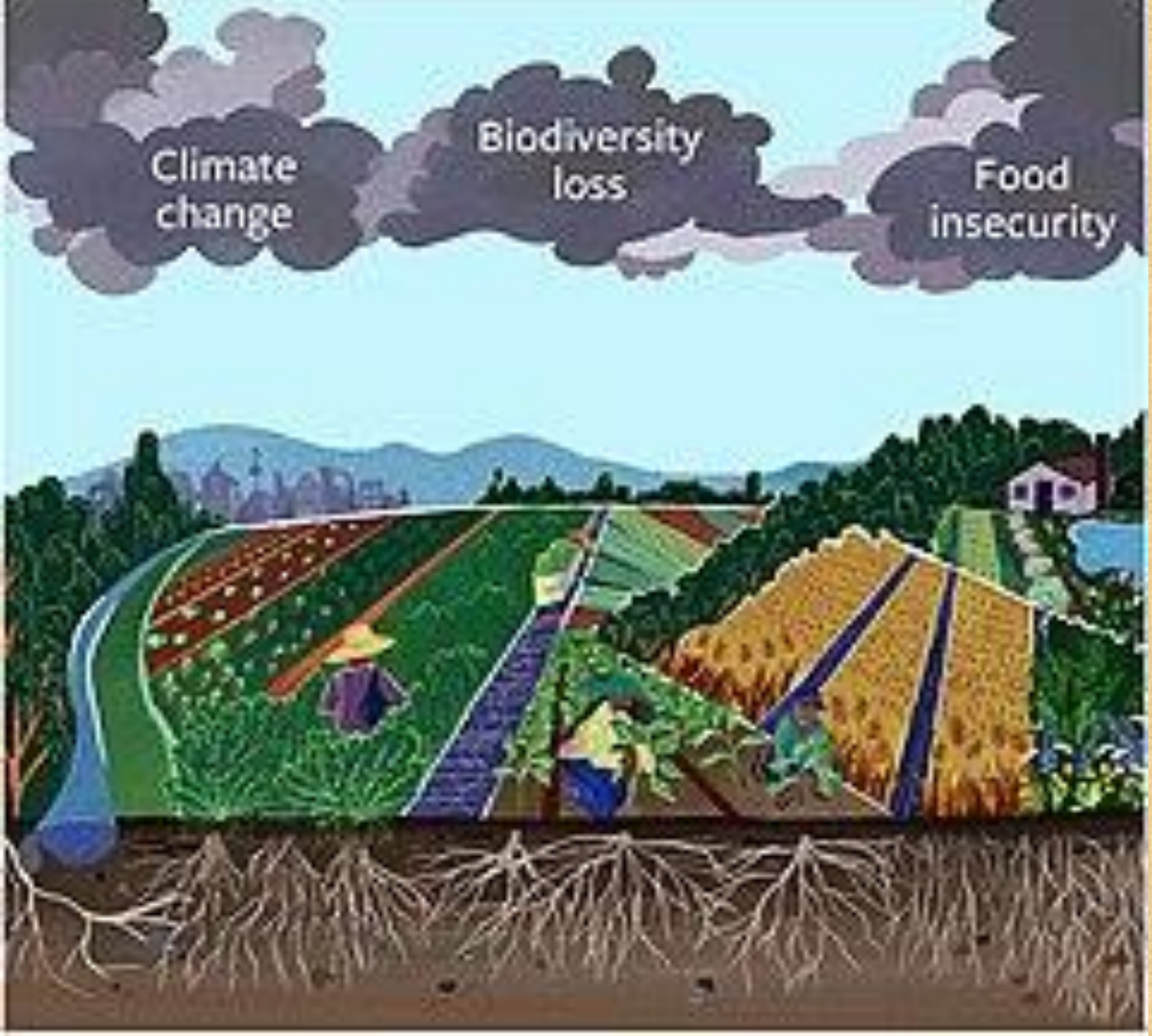


Note: Estimates of long-term biomass come with significant uncertainty, especially for wild mammals 100,000 and 10,000 years ago.

Sources: Barnosky (2008); Smil (2011); and Bar-On et al. (2018).



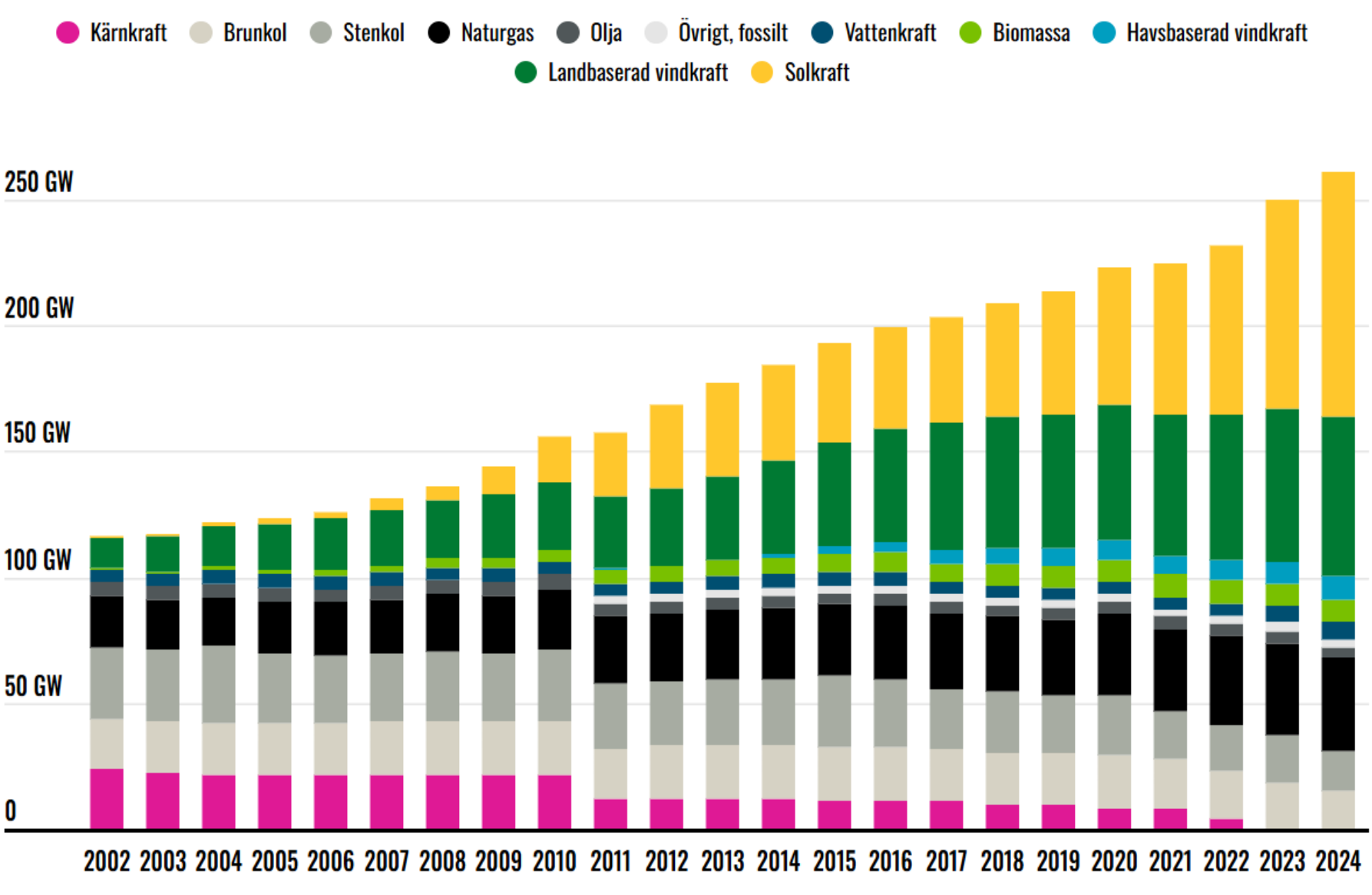
By Potsdam Institute for Climate Impact Research (PIK) – https://www.pik-potsdam.de/en/output/infodesk/planetary-boundaries/images, CC BY 4.0, https://commons.wikimedia.org/w/index.php?curid=145879239



Anthropo-cene

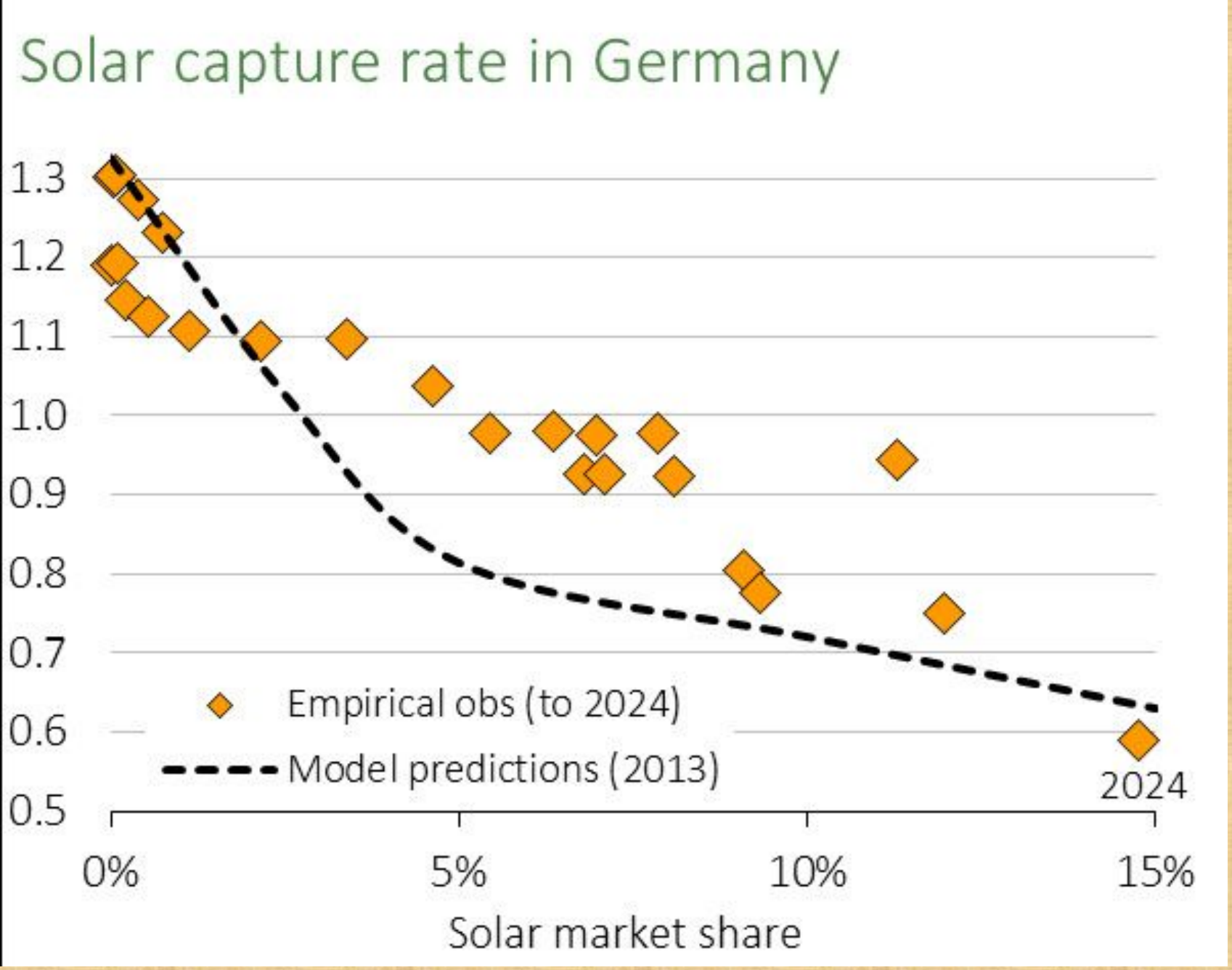
What we need to do

Climate	Half emissions each decade
Biodiversity	Protect 30 % of all areas land and water
Water	Use water wisely
Economy	Circular economy



Netto installed el production capacity in Germany.
Source: Energy-charts.info

Solar capture rate in Germany



https://lnkd.in/eFtNgpfR **Lion Hirth,** Prof at Hertie School & director at Neon · Power systems & energy markets

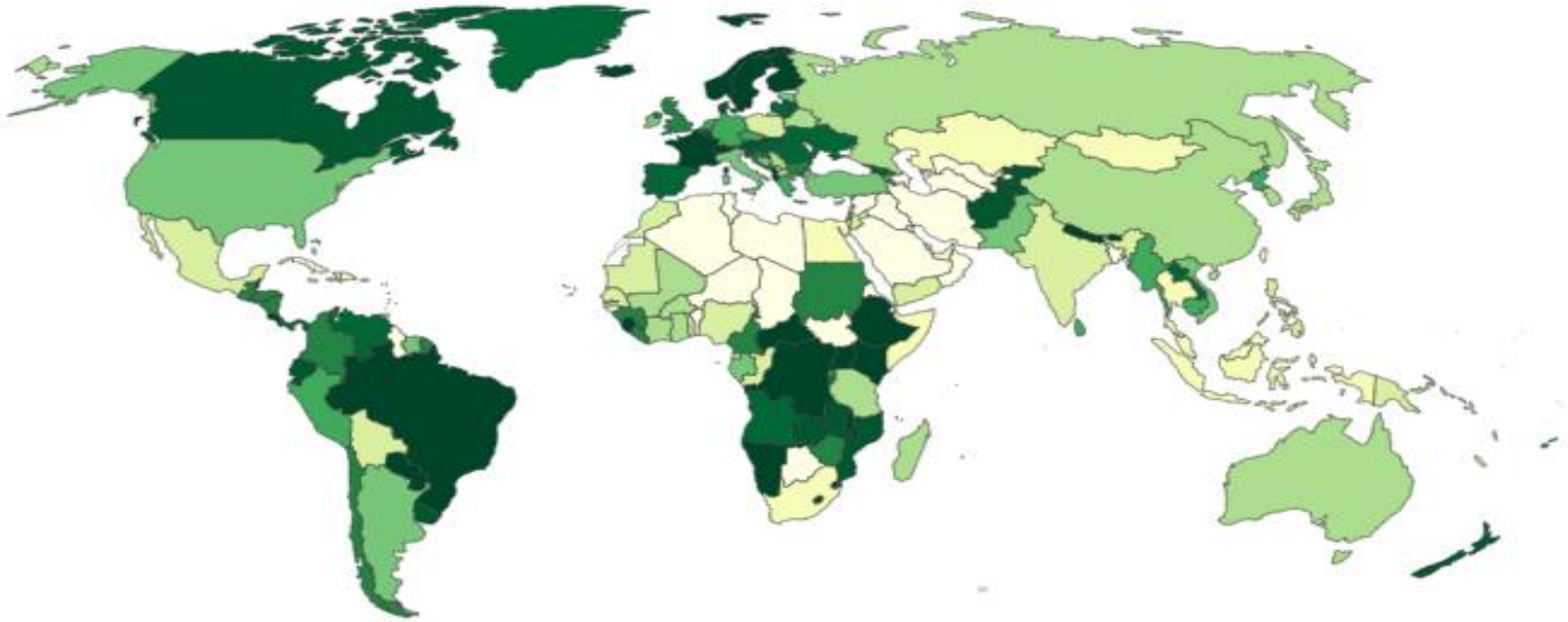
Share of electricity generated by low-carbon sources, 2023

Our World in Data

Low-carbon electricity is the sum of electricity from nuclear and renewable sources (including solar, wind, hydropower, biomass and waste, geothermal and wave and tidal).

Table | Map | Chart

World



No data 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

New rules to be implemented

Fit for 55

The European climate law makes reaching the EU's climate goal of reducing EU emissions by at least 55% by 2030 a legal obligation.

https://www.consilium.europa.eu/en/policies/fit-for-55/

Rewilding Europe

New rules to be implemented

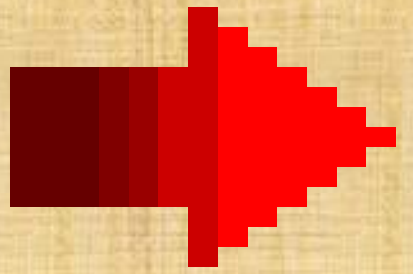
The Kunming-Montreal Global Biodiversity Framework

2030 Targets

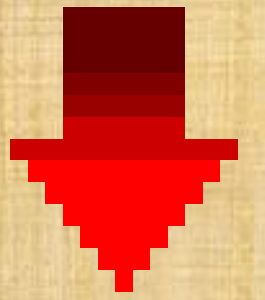
https://www.cbd.int/gbf/targets

https://www.adi-international.org/the-future-of-water-recycling-technologies-and-benefits/

Production

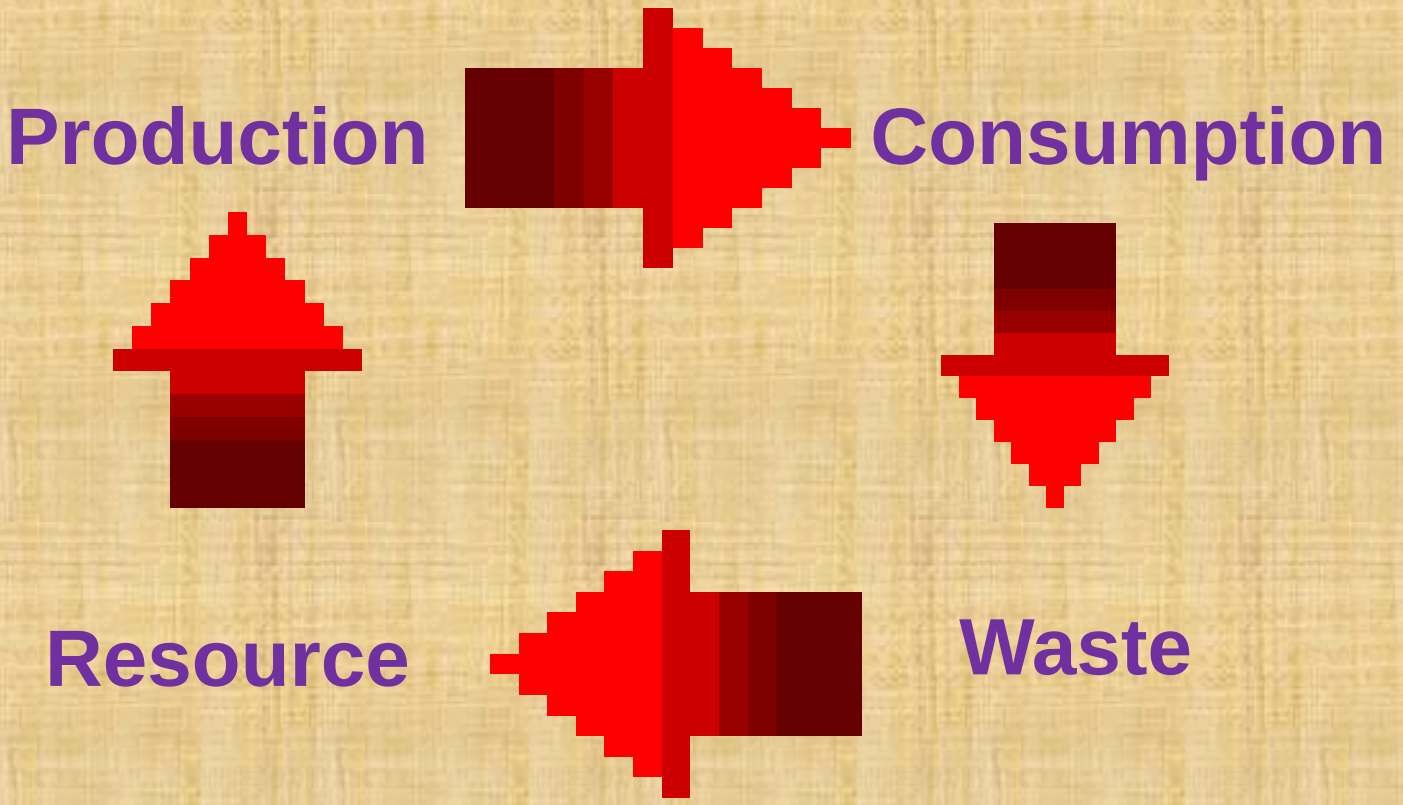


Consumption



Resource

Waste


Production
Consumption
Resource
Waste

3R
Reduce-Reuse-Recycle

We need to do both!

Sufficiency

Efficiency

Education for Sustainable Development

Key questions

Systems understanding

Integration

Implementation

Sustainable Development is a systems study


Aral Sea,
1957 coastal line
in red

Cause: Diversion of rivers to irrigate cotton
Effect: A whole system of impacts

Nature

- Ecosystem collapse
- Loss of soil fertility

Society

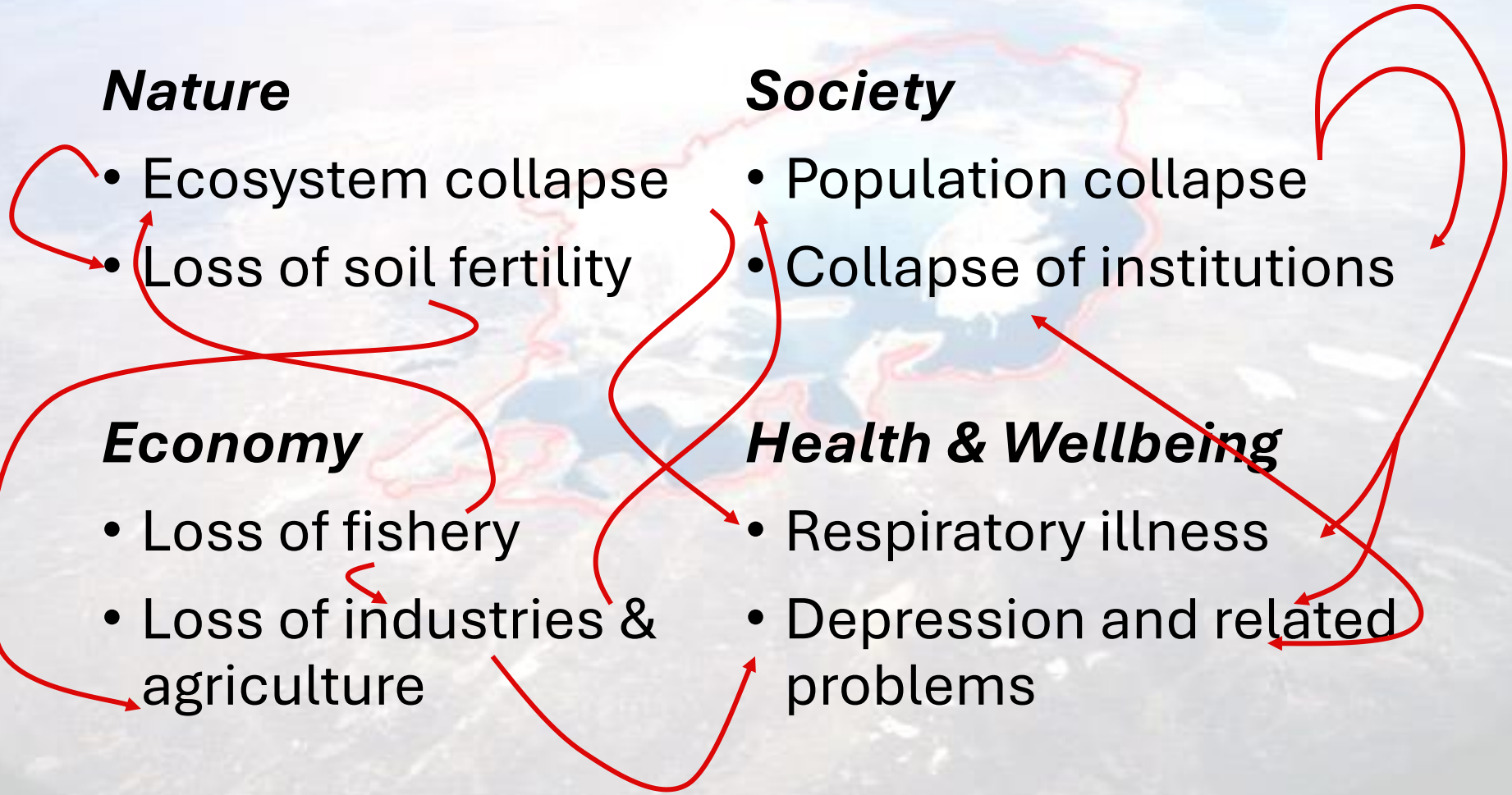
- Population collapse
- Collapse of institutions

Economy

- Loss of fishery
- Loss of industries & agriculture

Health & Wellbeing

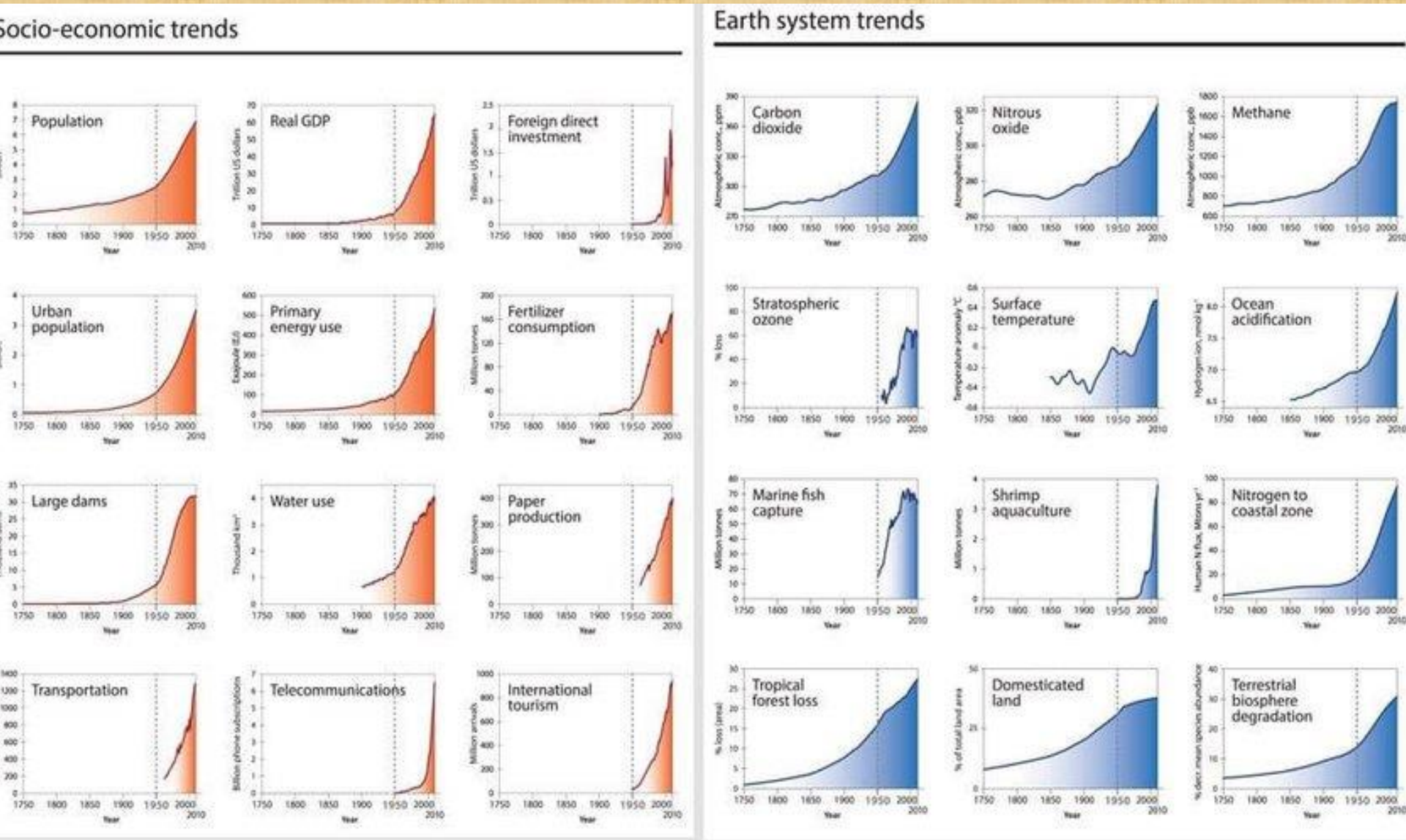
- Respiratory illness
- Depression and related problems



Three ways to study systems

1. Narratives - the stories
2. Integration – the components
3. Calculations - system dynamics

The great acceleration



Updated Great Acceleration Graphs

Source: Will Steffen et al. "The trajectory of the Anthropocene: The Great Acceleration." The Anthropocene Review, March 2015

Sustainable Development Goals 2030

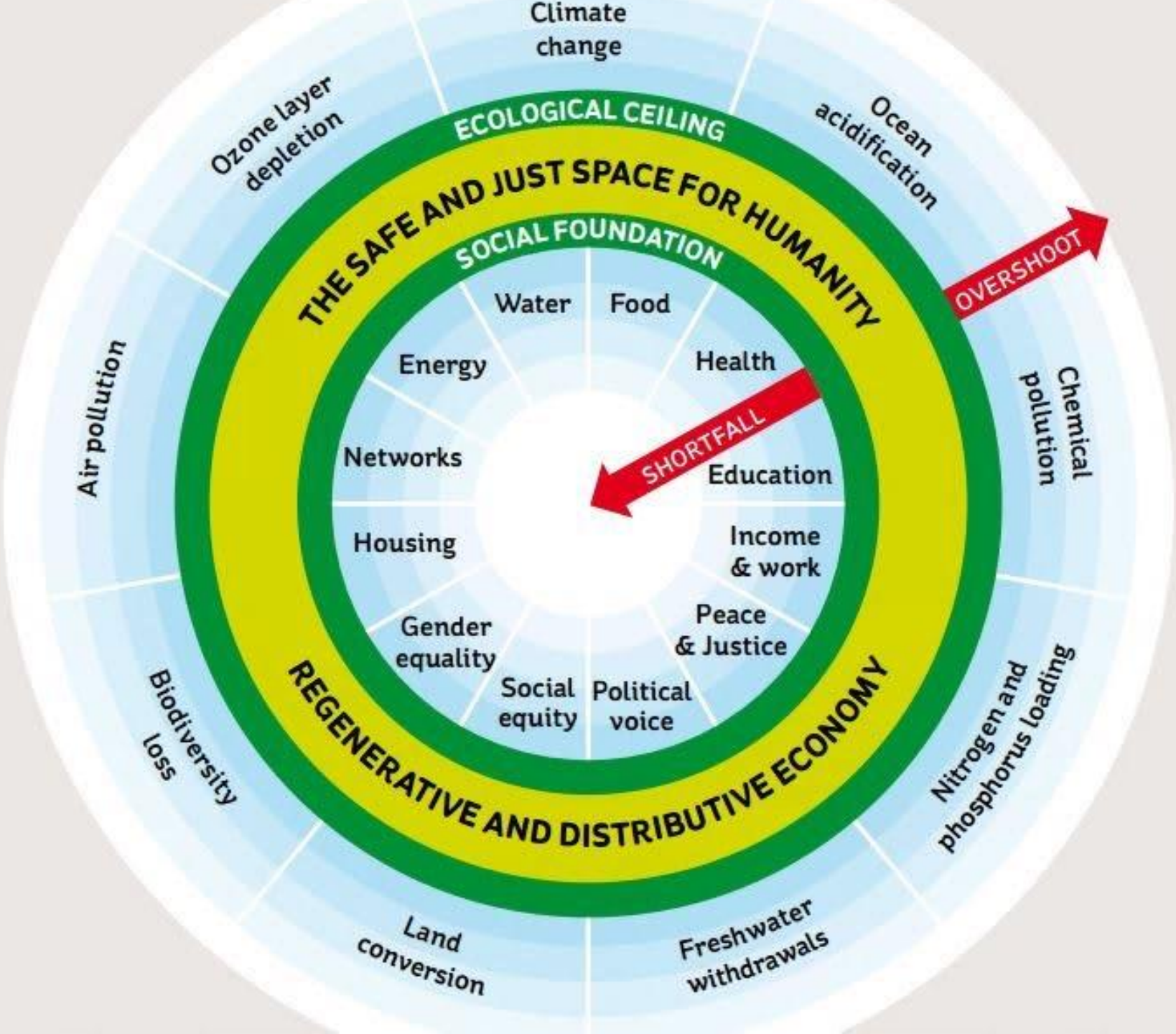
The SDGs are all connected to each other

https://blog.kumu.io/a-toolkit-for-mapping-relationships-among-the-sustainable-development-goals-sdgs-a21b76d4dda0


17 PARTNERSHIPS FOR THE GOALS
ECONOMY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
SOCIETY
1 NO POVERTY
11 SUSTAINABLE CITIES AND COMMUNITIES
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
7 AFFORDABLE AND CLEAN ENERGY
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
2 ZERO HUNGER
BIOSPHERE
15 LIFE ON LAND
14 LIFE BELOW WATER
6 CLEAN WATER AND SANITATION
13 CLIMATE ACTION

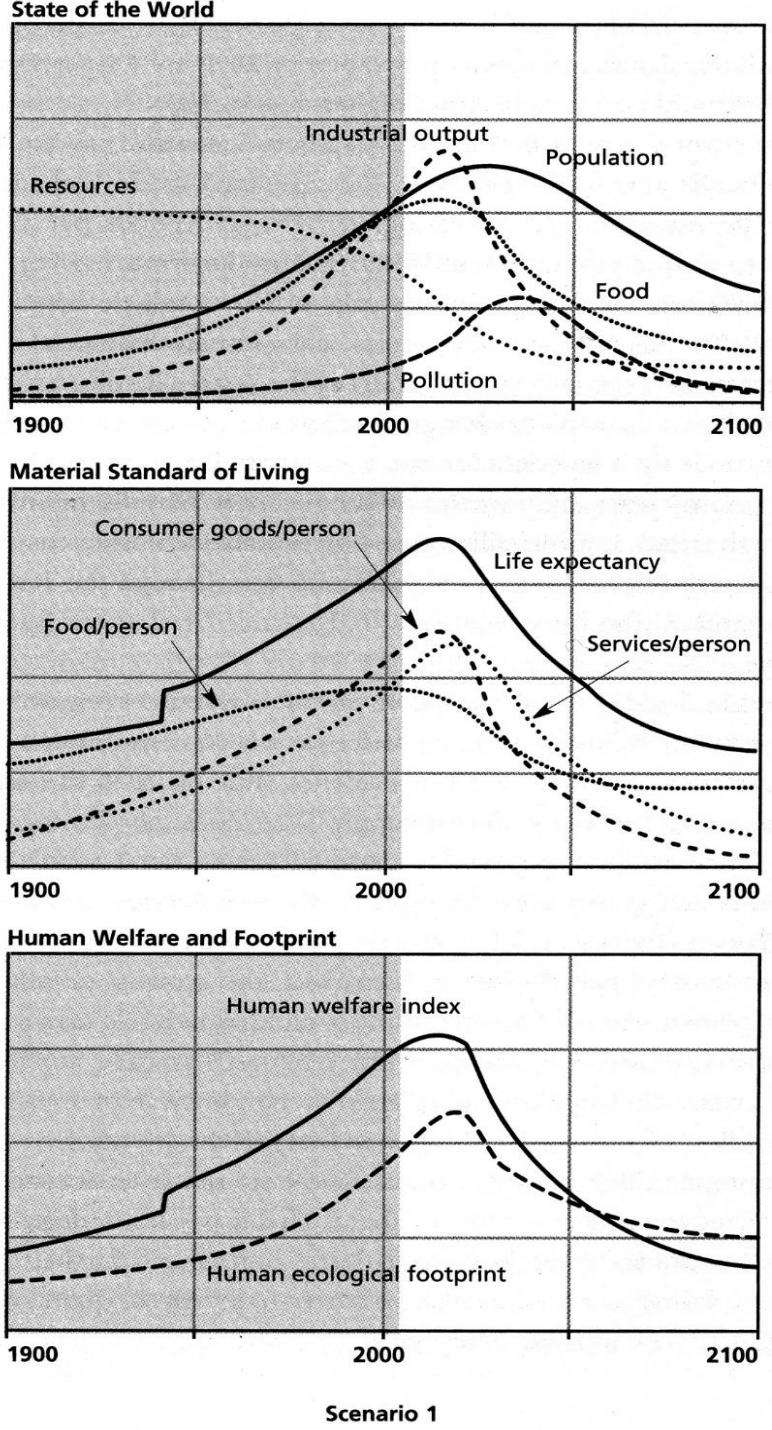
The **Doughnut**, or **Doughnut economics**, combine the planetary boundaries with social boundaries. It is a concept proposed by the British economist Kate Raworth.

https://www.kateraworth.com/doughnut/

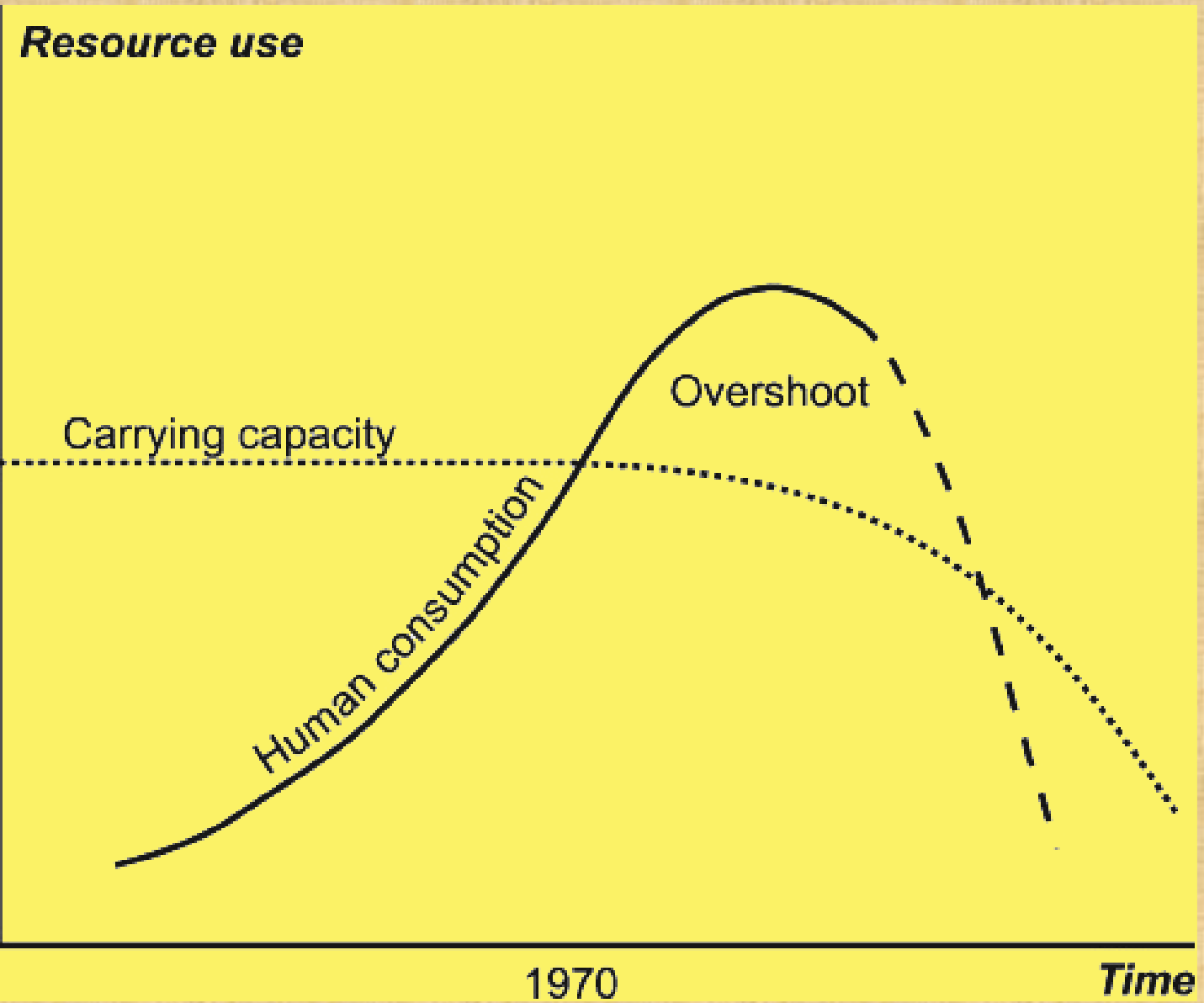

Climate change
Ozone layer depletion
Ocean acidification
ECOLOGICAL CEILING
THE SAFE AND JUST SPACE FOR HUMANITY
SOCIAL FOUNDATION
OVERSHOOT
Water
Food
Energy
Health
SHORTFALL
Networks
Education
Housing
Income & work
Peace & Justice
Gender equality
Social equity
Political voice
REGENERATIVE AND DISTRIBUTIVE ECONOMY
Air pollution
Chemical pollution
Biodiversity loss
Nitrogen and phosphorus loading
Land conversion
Freshwater withdrawals

Basic scenario in Limits to Growth 2003

World3



Development!



From

Wackernagel and Reese

The ecological footprint

”Overshoot” depends
-Fossil fuels
-Overfishing
-Deforestation
-etc

Thank you !